

## Insect Identification Sources

Frank A. Hale, Ph.D.  
Professor  
Entomology and Plant Pathology



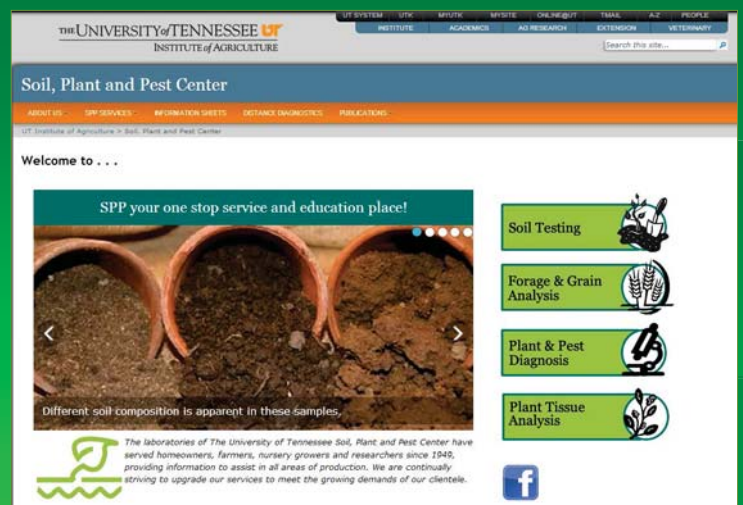
## Soil, Plant and Pest Center

Ellington Agricultural Center, Nashville



## Soil, Plant and Pest Center

- Soil Testing
- Insect Identification
- Plant Problem Diagnosis



## New Presentations, Publication, Information

### Soil, Plant and Pest Center

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UT Institute of Agriculture > Soil, Plant and Pest Center >

### Publications • Presentations • New Information

Updated February 2016

- Insect Management: Alternatives to Neonicotinoid use in Landscapes and Garden Centers
- Edible Ornamental Plant Pest Management: Options for Controlling Arthropod Pests on Fruiting Trees and Shrubs in Residential Landscapes
- An Ornamental Plant Pest Management Guide and Pesticide Rotation Planning Aid: Control Options for Nursery, Greenhouse, Interiorscape, and Commercial Landscape Use Sites
- Nursery Inspectors 2016
- Systems approach to disease management 2016

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THE UNIVERSITY OF TENNESSEE

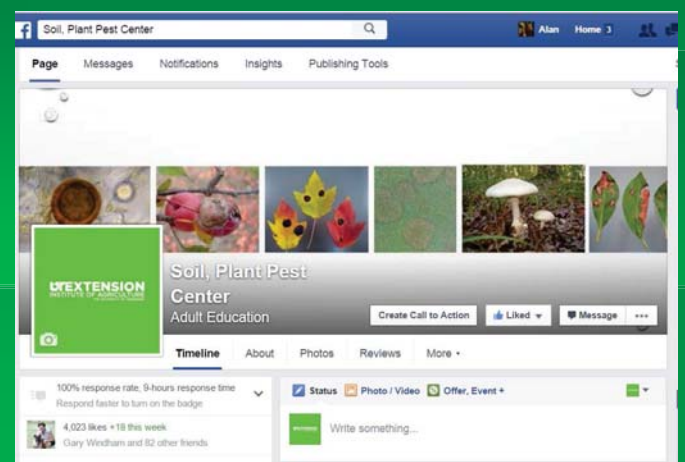
For the latest news and information, be sure to visit us on Facebook.



### External Links

- Arborvitae leafminer: a new pest of arborvitae in Tennessee

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# Publications from UT Extension



# APPS FOR YOUR SMART PHONE OR TABLET

## IPMPro app

App LIVE and AVAILABLE for download May 21, 2012

**Green Industry Professionals IPMPro app. is for you!**



**Nursery growers, landscapers, arborists, Extension agents, and students will find IPMPro a lifesaver in the field!**

A tour de force of nursery and landscape pest management, IPMPro mobile device app. will streamline your pest management decision-making, employee training, and make complying with state pesticide recordkeeping regulations easy!

Imagine having a leading expert send you a text to alert you about pests as they emerge and time-sensitive cultural tasks! Built by leading horticulture and pest management experts, IPMPro is like having an expert with you on the job every day!

**Available for iPhone, iPad, and Android**

For iPhone or iPad version visit: [App Store - IPMPro Download](#)

For Android version visit: [Android Store - IPMPro Download](#)

IPMPro can provide you with:

- Major pest and cultural practices reference at your finger tips!
- Automatic text-like alerts for time-sensitive pest issues and cultural practices - alert date adjusted specifically for your location!
- Viewable as a calendar or chronological list of action items for easy reference!
- Contains images, pest lifecycle, and management options for major pests of woody plants!
- Provides pesticide recommendations for major diseases and insects!
- Built-in pesticide recordkeeping to make outdoor, and on-the-go recordkeeping easy!

## Frequently Asked Questions

Follow the link above to find answers to the questions below:

- Who should buy the app?
- Why is IPMPro \$24.99? Many apps are free or cheap
- In what states is it most applicable?
- Why do I have to fill in information when I download the app?
- How do I receive the text-like alerts (push notifications)?
- Why do the alerts come at 4:00PM pm and on the weekends?
- Can I change when the alerts occur?
- Will the alerts cost money?
- How are the entomology alert dates derived?
- What do the bars in the calendar mean?

## For More Information

Email Amy at [IPMProApp@utk.edu](mailto:IPMProApp@utk.edu)

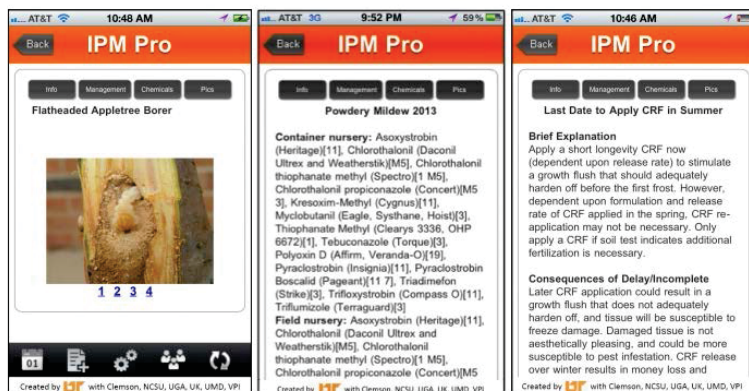
Thank you for your interest in IPMPro.

Sincerely,  
The Development Team

### Tennessee (Lead Institution)

Amy Fulcher (Lead Developer), University of Tennessee Institute of Agriculture, Department of Plant Sciences  
Frank Hale, The University of Tennessee Institute of Agriculture, Soil, Plant and Pest Center  
William Klingeman, The University of Tennessee Institute of Agriculture, Department of Plant Sciences  
Alan Windham, The University of Tennessee Institute of Agriculture, Soil, Plant and Pest Center

# IPMPro App



By Purdue University

Open iTunes to buy and download apps.



### Description

The Purdue Tree Doctor app has been developed by experts at Purdue University to help people better identify and manage tree problems caused by a variety of factors, including insects and diseases. Landscape professionals, arborists, and garden center personnel can use this app to improve communication with their customers.

[Purdue Tree Doctor Support](#)

### What's New in Version 1.5.6

Spring 2016 Content Update

[View in iTunes](#)

This app is designed for both iPhone and iPad

\$1.99

Category: Reference

Updated: Jun 04, 2016

Version: 1.5.6

Size: 262 MB

Language: English

Seller: Purdue University

© Purdue University

Rated 4+

Compatibility: Requires iOS 8.4 or later. Compatible with iPhone, iPad, and iPod touch.

### Customer Ratings

We have not received enough ratings to display an average for the current version of this application.

All Versions:

★★★★ 20 Ratings

More by Purdue University

[Purdue Tree Doctor](#)

[Purdue Tree Doctor](#)

[Purdue Tree Doctor](#)

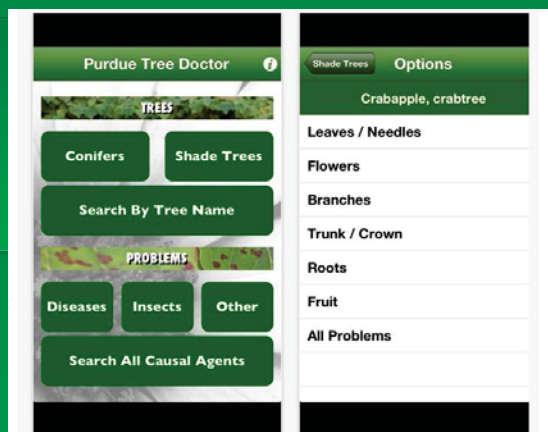
[Purdue Tree Doctor](#)

### Screenshots

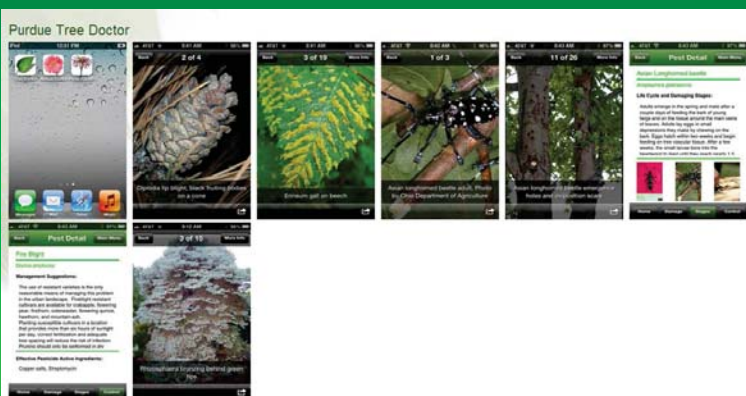




# Purdue Tree Doctor



# Purdue Tree Doctor App



Give us a Call: 229-386-3298

Home Our Applications Contact

IveGot1

IveGot1 brings the power of EDDMapS to your phone. Now you can submit invasive species observations directly with your phone from the field. These reports are sent to local and state verifiers for review. IveGot1 was developed by the University of Georgia Center for Invasive Species and Ecosystem Health through a cooperative agreement with the National Park Service, in cooperation with the Florida Fish and Wildlife Conservation Commission and the University of Florida Center for Aquatic and Invasive Plants. IveGot1 is more than just an iPhone app, it is an integrated invasive species reporting and outreach campaign for Florida that includes the app, a website with direct access to invasive species reporting and a hotline 1-888-IVEGOT1 for instant reports of live animals.

[Learn More](#)

## The Center for Invasive Species & Ecosystem Health

The Center is involved in numerous grant funded projects and cooperative agreements relating to invasive species, integrated pest management and forest health.

The Center integrates science based resources with information technology applications and graphic design tools to provide a wide array of services. The Center's award-winning staff works with the client organization to efficiently develop and deliver the best product in a timely fashion to meet their specific needs.

## Available Apps

View all apps currently available from the Center for Invasive Species and Ecosystem Health on iTunes and Google Play.

Available on the

Utilizing partnerships & information technology to advance invasive species, forestry & agriculture education

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**Forestry Images**

- Invasive.org
- EDDMapS
- Bugwood Wiki
- Insect Images
- IPM Images
- Bugwood Apps

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**Topics**

- Agriculture
- Bark Beetles
- Christmas Trees
- Corngrasses
- Forest A Syst
- Forest Pests
- Forest Productivity
- Forestry
- Insects
- Invasive Species
- IPM
- Plant Diseases
- Plants
- Prescribed Fire
- Silvopasture
- Urban Forestry
- Wetlands
- Wildly Prevalent Species
- Wildlife

**What's New**

White Flies is setting invasive launch in Florida

The usefulness, value and utility of BugwoodImages is demonstrated in the April 2016 issue of "IPM Insider", the Newsletter of the Northeastern (USA) IPM Center

Rampaging Radiactive Wild Boars Causing Havoc

Map Catery Pear Challenge!

Trees in Trouble: A documentary film about America's Urban Forests. Coming to PBS

Native Predators May Be Having a Larger Impact than Expected on Invasive Snake Bug

[More News from the Bugwood Blog](#)

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**Quick Links**

- [Emerald Ash Borer - Georgia Info](#)
- [Georgia Invasive Plant Management Handbook](#)
- [Forest Pest Control Handbook](#)
- [Forest Health Guide for Georgia Foresters](#)

**Invasive Plant Atlas of the United States**

The Invasive Plant Atlas of the United States is a collaborative effort between the National Park Service, the University of Georgia, and the United States Forest Service.

Utilizing partnerships & information technology to advance invasive species, forestry & agriculture education

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## Image Archives

**Bugwood Image Database Home**

This is the central site for users to manage the settings on their account. For photographers it includes an image uploader, profile page editor, statistics on image use, and an image recruitment area to let you know what images people need.

**Forestry Images**

Forestry Images provides an accessible and easily used archive of high quality images related to forest health and silviculture.

**Insect Images**

Insect Images provides an accessible and easily used archive of high quality images related to insects focusing on the organization of images by taxonomic relationships and the type of damage they cause and the various life stages of each species. The Entomological Society of America has begun to work with us to improve the site and develop new functionality to meet the needs of Entomologists.

**IPM Images**

IPM Images provides an accessible and easily used archive of high quality images related to Integrated Pest Management of various commodities. The organization of the site lends itself to finding images of insects or diseases in individual commodities. This site also serves as a portal for diagnostic laboratories in finding and contributing images to be used in education and training across the nation and the world.

**Weed Images**

Weed Images is a cooperative project with the Weed Science Society of America. It features high quality images related to weeds in agronomic crops, herbicide symptoms and other topics of importance to Weed Science.

**Invasive.org**

Increased interest in the effect of invasive species on our natural ecosystems created a great demand for quality images to identify current and potential invaders. Invasive.org provides an accessible and easily used archive of high quality images related to identification and management of invasive species.

**ForestPests.org**

ForestPests.org provides an accessible and easily used archive of high quality images related to insects and diseases affecting forests. We have focused on symptomatology and identification features as well as information on the monitoring and management of insects and diseases found in forests.

**Topics**

- Agriculture
- Bark Beetles
- Christmas Trees
- Corngrasses
- Forest A Syst
- Forest Pests
- Forest Productivity
- Forestry
- Insects
- Invasive Species
- IPM
- Plant Diseases
- Plants
- Prescribed Fire
- Silvopasture
- Trees
- Urban Forestry
- Wetlands
- Wildly Prevalent Species
- Wildlife

# Forestry Images

Check out our News

FORESTRY IMAGES Forest Pests Trees & Plants Silviculture Invasive Species Urban Forestry Wildlife Help

Browse Search

**Filter by**

- Nodes
- Photographers
- Organization
- Location
- Hosted Archives
- Selected Image Sets
- Image Series

**General Info**

- What is Forestry Images?
- Membership Benefits
- Frequently Asked Questions
- Finding Images
- Using Images
- Adding Images
- Statistics
- Technical Requirements
- Contact Us

**Image Categories**

**Forest Pests**

- Insects
- Bark Beetles | Foliar Feeding | Wood Boring | Invasive | Diseases
- Other Damage Agents
- Invasive Plants | Parasitic Plants | Human | Animal

**Trees, Plants, and Stand Types**

- Trees
- Conifers | Hardwoods | Mixed Stands | Understory and Rangeland Plants
- Forbs | Shrubs | Vines | Grasses

**Silvicultural Practices**

- Fire | Harvest Operations | Natural Regeneration | Urban Forestry
- General | Tree Defects | Urban Tree Care

**Wildlife**

- Mammals | Birds | Reptiles & Amphibians
- People, Places and Scenes
- North America | Africa | Miscellaneous

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**Random Image**

Stash pine

Photo by David J. Mountaint, University of Georgia

**Statistics**

244,545 images

23,138 subjects

2,414 photographers

[News & Site Updates](#)

## Insects

### Insect Categories

- Foliage Feeding Insects
- Bark Beetles
- Weevils
- Boring Insects
- Chewing Insects
- Sucking Insects
- Gallmakers
- Seed / Cone / Flower / Fruit Insects
- Stinging / Biting / Nuisance Insects
- Insect Parasites and Parasitoids
- Insect Predators
- Misc. Insects

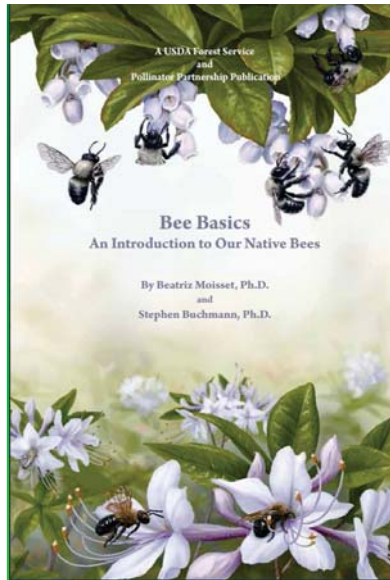
### Insect Orders

- ants, bees, sawflies, wasps, and allies (Hymenoptera)
- beetles (Coleoptera)
- bugs, cicadas, aphids and scale insects (Hemiptera)
- butterflies, moths, and skippers (Lepidoptera)
- cockroaches (Blattodea)
- damselflies and dragonflies (Odonata)
- earwigs (Dermaptera)
- flies (Diptera)
- grasshoppers (Orthoptera)
- lacewings, allies (Neuroptera)
- lice (Phthiraptera)
- mantids (Mantodea)
- silverfish, firebrats (Thysanura)
- termites (Isoptera)
- thrips (Thysanoptera)
- walkingsticks (Phasmatodea)

### Related Organisms



redheaded pine sawfly larva  
Photo by Gerald J. Lenhard, LSU



[http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5306468.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5306468.pdf)

## Garden Insects of North America

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Ecologically, bees can be separated into two groups based on the relative length of mouthpart segments within their tongues, called proboscides. The long and short tongues are used to gather nectar.

Some long-tongued bees like *Apis* and *Megachile*, favor deep flowers with a



A long-tongued bee (*Androphora confertifrons*) drinking nectar from a honeysuckle flower (*Lonicera periclymenum*).



A short-tongued bee in the genus *Colletes* taking nectar from the shallow center of a sunflower (*Helianthus annuus*).

6

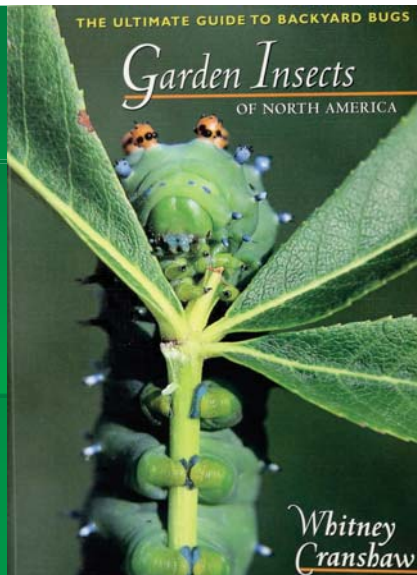
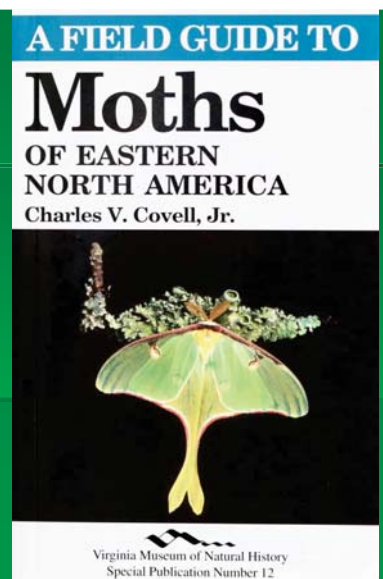
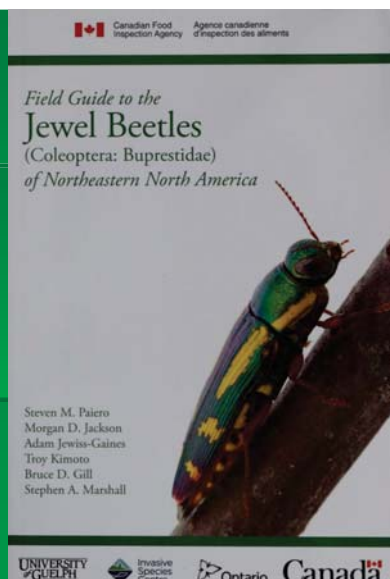
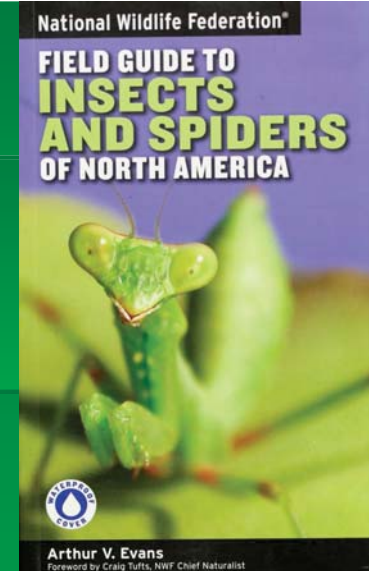
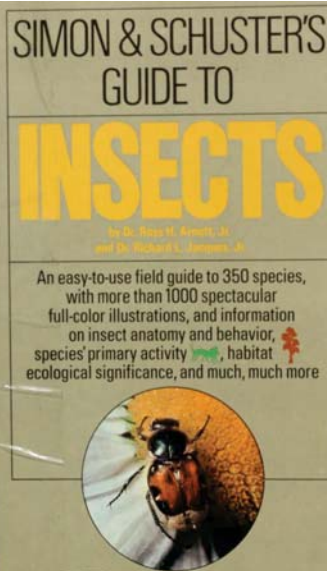
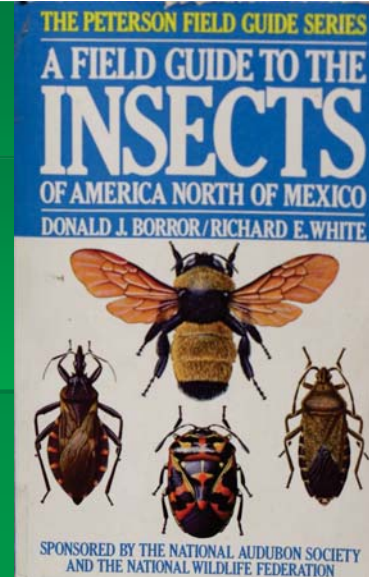




Plate from Kaufman Field Guide to Insects of North America



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THE PETERSON FIELD GUIDE SERIES  
A FIELD GUIDE TO THE  
**MOTHS**  
OF EASTERN NORTH AMERICA  
CHARLES V. COVELL, JR.



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A FIELD GUIDE TO THE  
**BUTTERFLIES**  
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**CATERPILLARS**  
*in the*  
**FIELD AND GARDEN**

A FIELD GUIDE TO  
THE BUTTERFLY CATERPILLARS OF  
North America

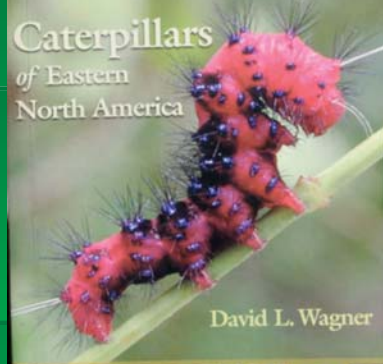
THOMAS J. ALLEN, JIM P. BROCK,  
JEFFREY GLASSBERG



PRINCETON FIELD GUIDES

**Caterpillars**  
*of Eastern*  
North America

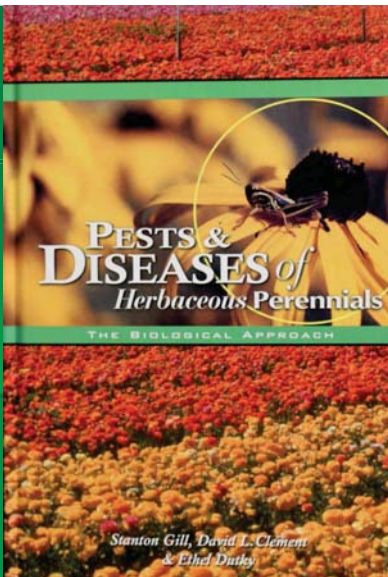
David L. Wagner



**PESTS & DISEASES of**  
*Herbaceous Perennials*

THE BIOLOGICAL APPROACH

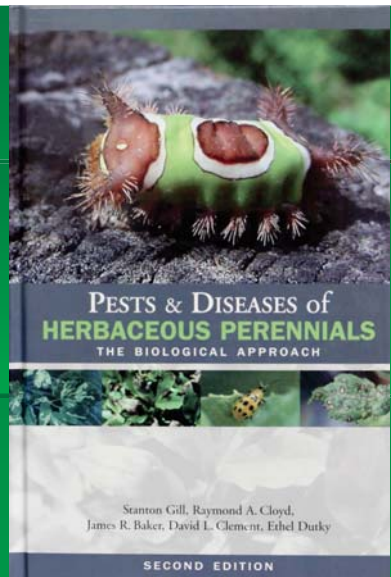
Stanton Gill, David L. Clement  
& Ethel Dutky



**PESTS & DISEASES of**  
**HERBACEOUS PERENNIALS**  
THE BIOLOGICAL APPROACH

Stanton Gill, Raymond A. Cloyd,  
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SECOND EDITION



BALL IDENTIFICATION GUIDE TO  
**GREENHOUSE PESTS  
AND BENEFICIALS**



By STANTON GILL  
AND JOHN SANDERSON

## Questions?



Mulberry whiteflies

<https://tiny.utk.edu/ag/insectandmite>

<https://tiny.utk.edu/ag/turf insect>



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