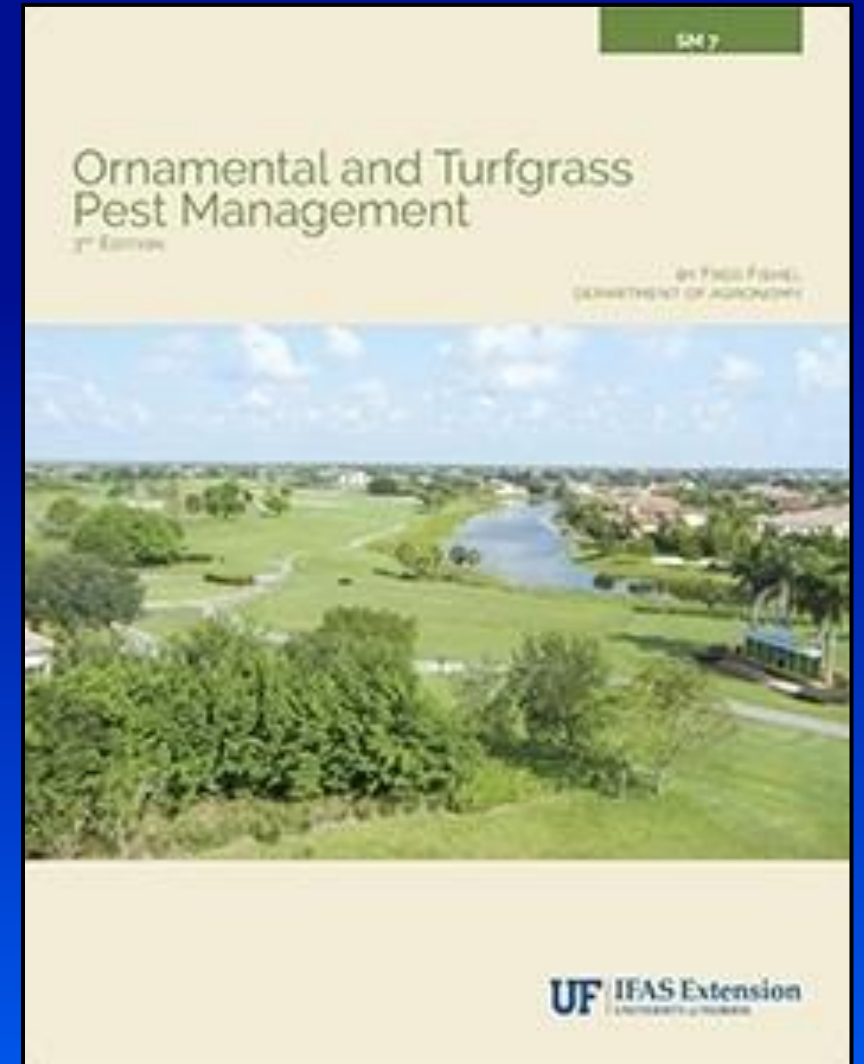


# Ornamental and Turfgrass IPM

Norm Leppla,  
UF/IFAS  
IPM Program Director



# Ornamental and Turfgrass IPM

## Learning Objectives

1. Explain integrated pest management.
2. Name the 5 main practices common to all IPM programs.
3. Explain pest identification.
4. Explain control-action guidelines.
5. Explain how to prevent pest problems.
6. Describe biological control.
7. Describe cultural control.
8. Describe physical and mechanical control.
9. Describe chemical control.

## Common Practices

- 1. Identify pests correctly**
- 2. Monitor and scout pests**
- 3. Follow control-action guidelines**
- 4. Prevent pest problems**
- 5. Use different IPM practices together (integrate)**

# What is Integrated Pest Management?

Integrated Pest Management (IPM) is a sustainable, science-based, decision-making process that combines biological, cultural, physical and chemical tools to identify, manage and reduce risk from pests and pest management tools and strategies in a way that minimizes overall economic, health and environmental risks.

(National IPM Roadmap)

<https://www.ars.usda.gov/ARSTUserFiles/O/PMP/IPM%20Road%20Map%20FINAL.pdf>

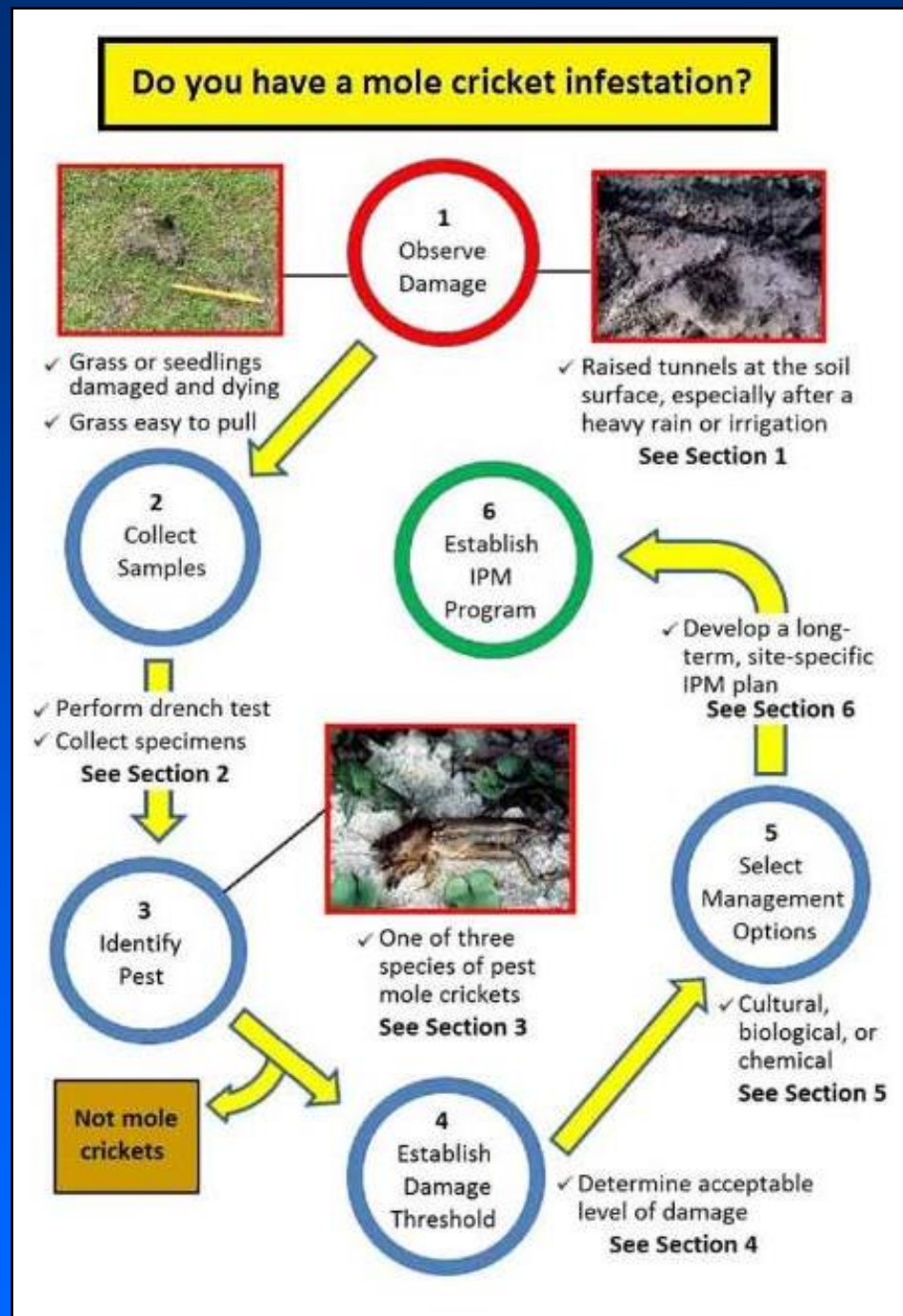
Integrated Pest Management (IPM) includes reducing pest management expenses, conserving energy, and reducing the risk of exposure to people, animals, and the environment.

A combination of effective tactics are used to manage pests at an acceptable level (threshold) on ornamental plants and turfgrass.

Use pesticides only if necessary because other methods have not maintained the pests at an acceptable level.

# Mole Cricket IPM Guide for Florida

<http://edis.ifas.ufl.edu/in1021>

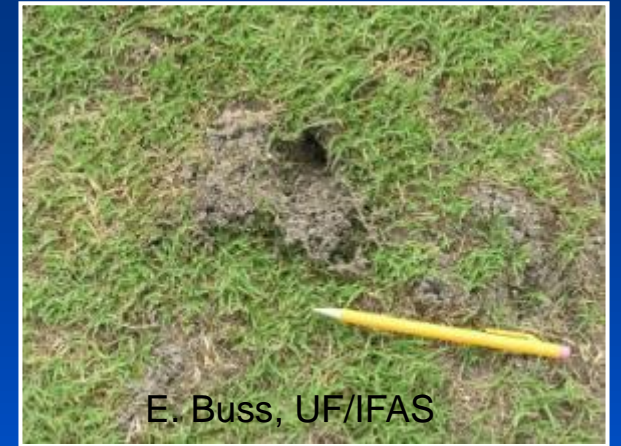


1. Identify pests correctly
2. Monitor and scout pests
3. Follow control-action guidelines
4. Prevent pest problems
5. Use different IPM practices together (integrate)

Chris Kerr, Norm Leppla, Eileen Buss, and Howard Frank



# Step 1: Observe Damage





# Step 2: Collect Samples



# Step 3: Identify Pest



Tawny mole cricket

*Neoscapteriscus vicinus*

Southern mole cricket

*Neoscapteriscus borellii*

Shortwinged mole cricket

*Neoscapteriscus abbreviatus*

# Pest Mole Cricket Geographical Distributions



*Neoscapteriscus vicinus*



*N. abbreviatus*



*N. borellii*



# Mole Cricket Stages of Development

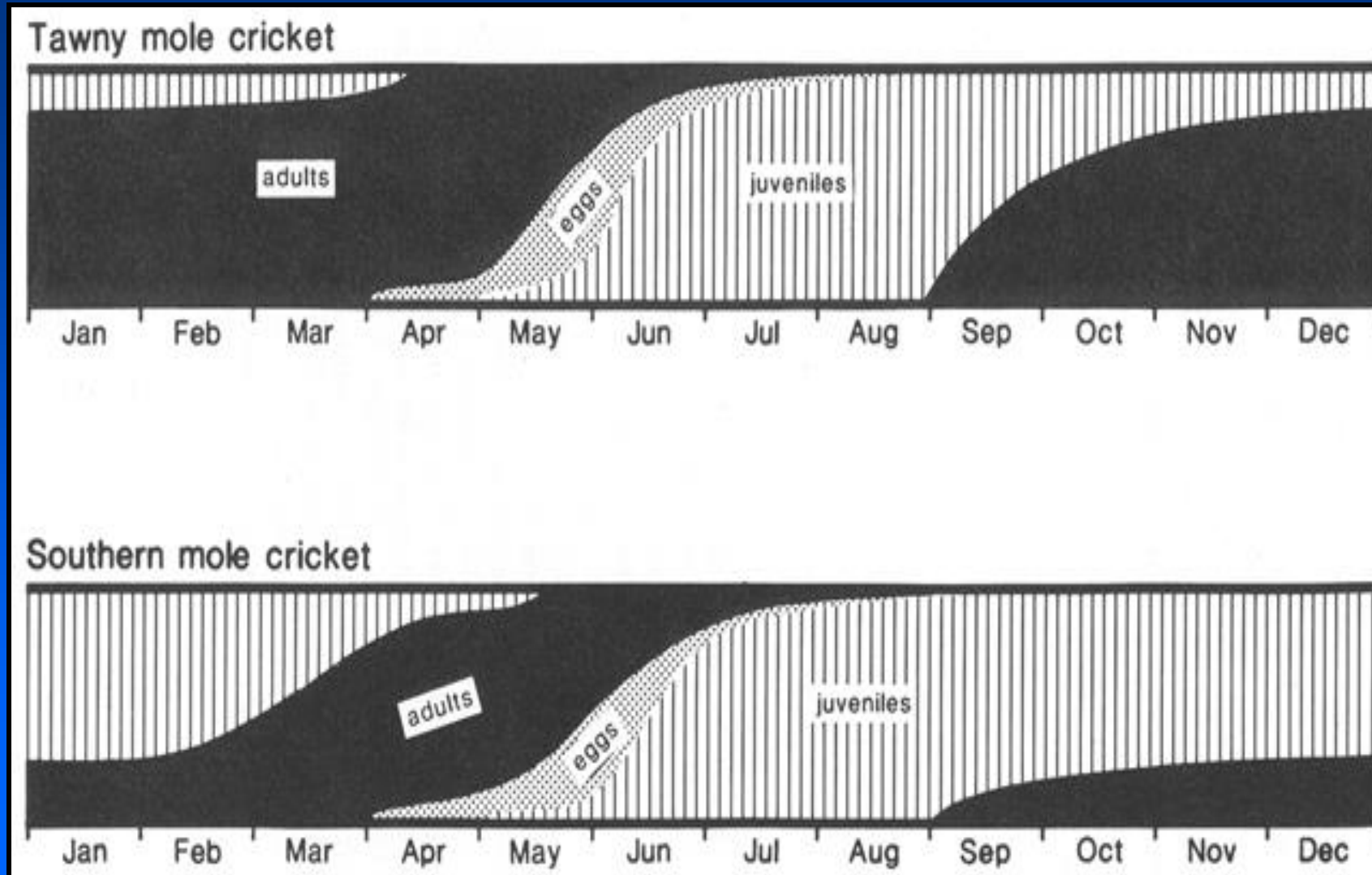


L. Buss



J. Castner

# Seasonal Distribution of Mole Cricket Stages





# UF/IFAS Diagnostic Services



Plant Disease



Insects



Nematodes



Soil/Water



Plant/Weed ID



Management

Have a plant issue and not sure what to do?



Find Your Local  
Plant Clinic



Submit a  
Digital Sample

<https://diagnostics.ifas.ufl.edu/>

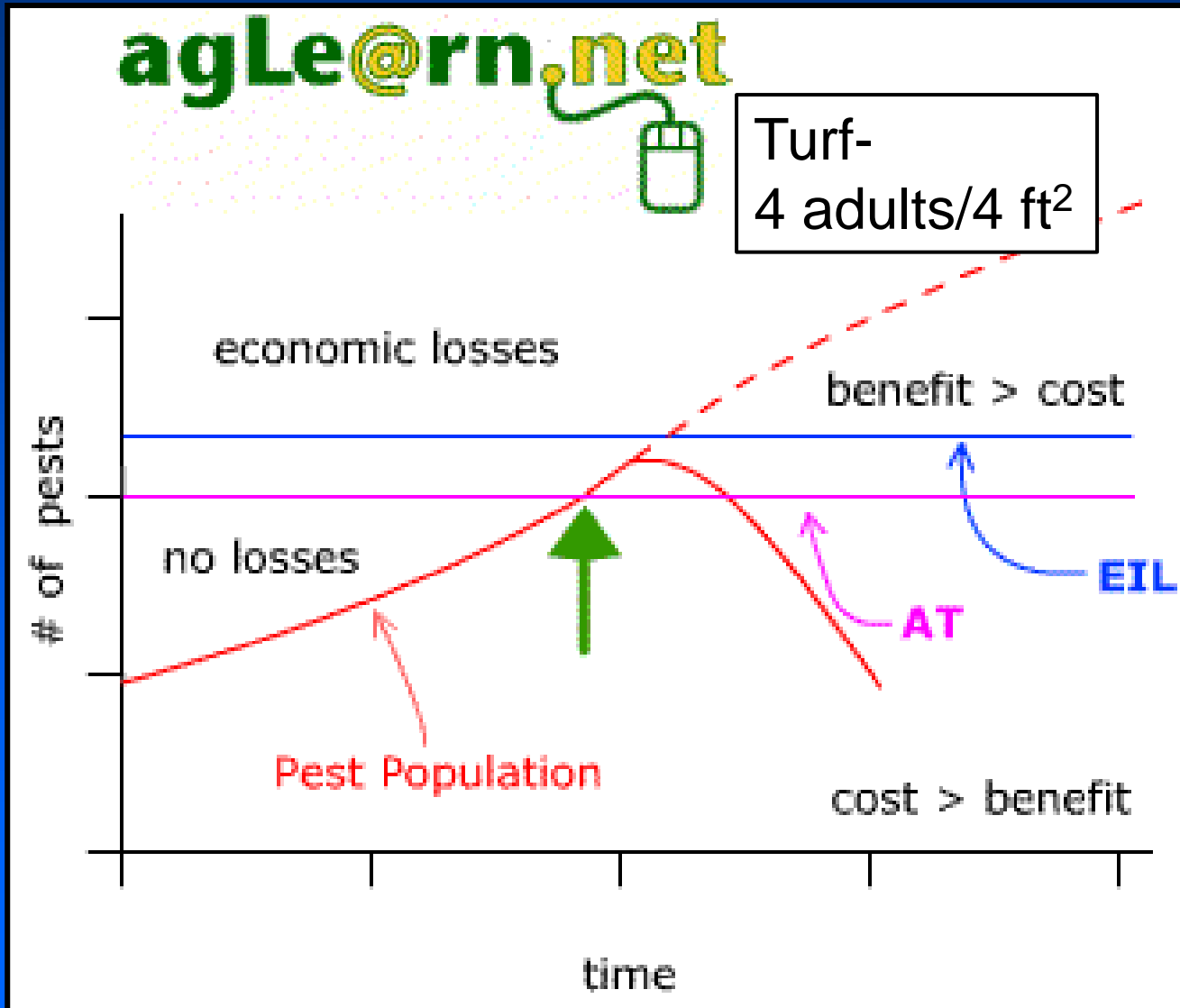
# Florida Department of Agriculture and Consumer Services Division of Plant Industry



<https://www.fdacs.gov/Divisions-Offices/Plant-Industry>



# Step 4: Establish Damage Threshold



1. Identify pests correctly
2. Monitor and scout pests
3. Follow control-action guidelines
4. Prevent pest problems
5. Use different IPM practices together (integrate)

# Step 5: Select Management Options

- Cultural control
- Mechanical control
- Tolerant cultivars
- Soil moisture
- Lighting
- Plant health
- Biological control
- Chemical control





# Mechanical and Physical Controls



# Chemical Control



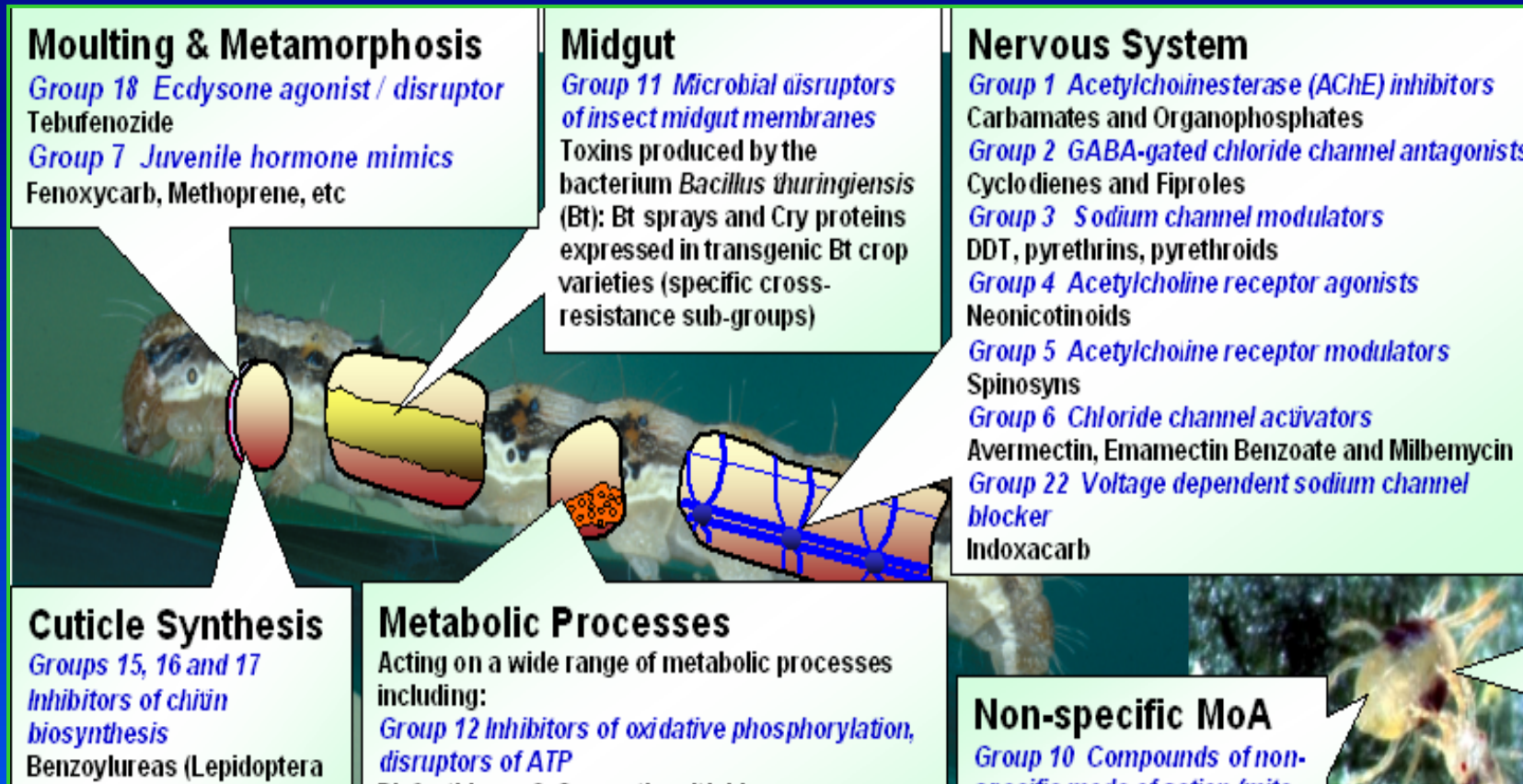
- Pesticides are poisons, follow label
- Avoid non-target effects, e.g., you
- Use pesticides only when needed
- Do not apply pesticides based on the calendar
- Select least toxic pesticides



# Insecticide Mode of Action

Maximize

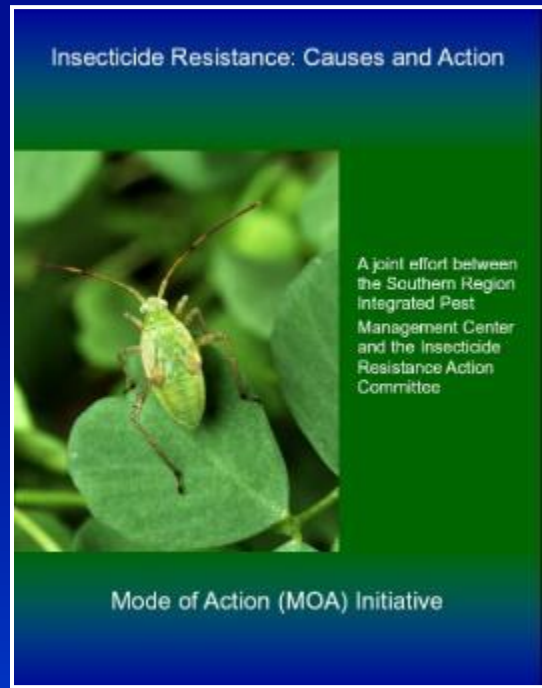
Minimize



IRAC- 32 groups plus unknown MOA



# Pesticide Resistance Management



**IRAC**

**HRAC**

**FRAC**

UF/IFAS Principles of Pesticides-

<http://agronomy.ifas.ufl.edu/pdfs/syllabi/ipm5305.pdf>

Alan Roe (Utah State University), New classes of pesticides-

<https://utahpests.usu.edu/slideshows/ppt/05sh-pesticides-new.pdf>

# Brand Name Versus Active Ingredient



Clothianidin 0.25%



Imidacloprid 0.72%  
Beta-cyfluthrin 0.36%





**KILLS OVER 500 LISTED PESTS**

**FOR HOME FRUIT & VEGETABLE GARDENS, ORNAMENTAL & FLOWER GARDENS, LAWNS, AND AROUND THE HOME**

**KILLS BY CONTACT AND KEEPS PROTECTING UP TO 3 MONTHS<sup>†</sup>**

**KEEP OUT OF REACH OF CHILDREN**

Active Ingredient: Zeta-Cypermethrin\* ..... 0.35%  
 Other Ingredients: ..... 99.65%  
 AA080216RT ..... 100.00%

**Net Contents: 1 Quart (946 mL)**

\*When used as directed  
<sup>†</sup>Except ticks  
 (\* This product contains 0.03 pounds active ingredient per gallon.)  
 \* Cis/trans ratio: Max. 75% (±) cis and min. 25% (±) trans



# Insecticide Active Ingredients Registered for Mole Cricket in Golf Courses and Athletic Fields

Active Ingredient	IRAC Number	Active Ingredient	IRAC Number
Acephate	1B	Fipronil	2B
Allyl isothiocyanate & capsaicin	--	Imidacloprid	4A
Beauveria bassiana	Biopesticide	Indoxacarb	22A
Beta-cyfluthrin	3A	Lambda-cyhalothrin	3A
Bifenthrin	3A	Permethrin	3A
Bifenthrin &	3A	Piperonyl butoxide &	27A
imidacloprid	4A	permthrin	3A
Bifenthrin &	3A	Piperonyl butoxide &	27A
zeta-cypermethrin	3A	pyrethrins	3A
Bifenthrin	3A		
imidacloprid &	4A	Pyrethrins	3A
zeta-cypermethrin	3A		
Carbaryl &	1A	Thiamethoxam	4A
bifenthrin	3A		
Chlorpyrifos	1B	Thiamethoxam &	4A
		azoxystrobin (fungicide)	--
Cyfluthrin	3A	Trichlorfon	1B

# Pesticide Information

- NPIRS (National Pesticide Information Retrieval System)-  
<https://pested.ifas.ufl.edu/>
- CDMS (Crop Data Management Systems)-  
<https://www.cdms.net/>
- EPA (Environmental Protection Agency)-  
<https://www.epa.gov/pesticides>
- UF/IFAS Pesticide Information Office-  
<https://pested.ifas.ufl.edu/>
- UF/IFAS Cooperative Extension-  
<https://sfyl.ifas.ufl.edu/>

# Prevention- Areawide Pest Management



E. Buss

Chinch bug damage



P. Harmon



Gray leaf spot



Mechanical Pest and Disease Inoculator



# Prevention- Areawide Pest Management



# Step 6: Establish IPM Program

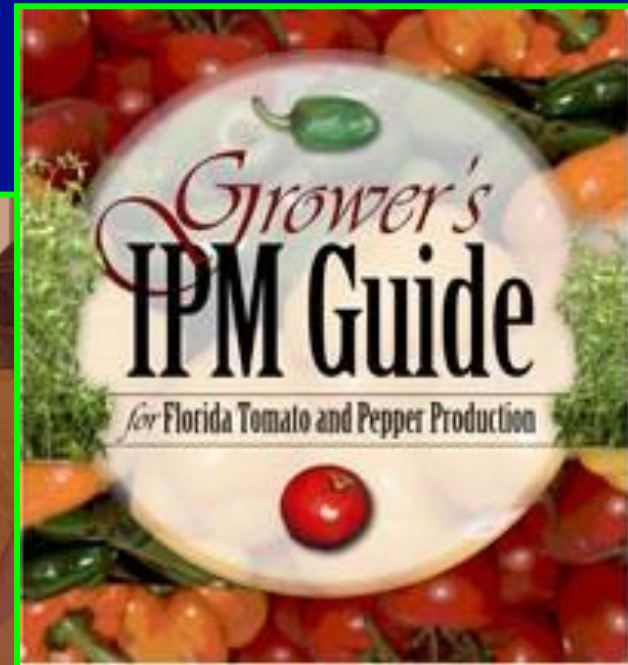
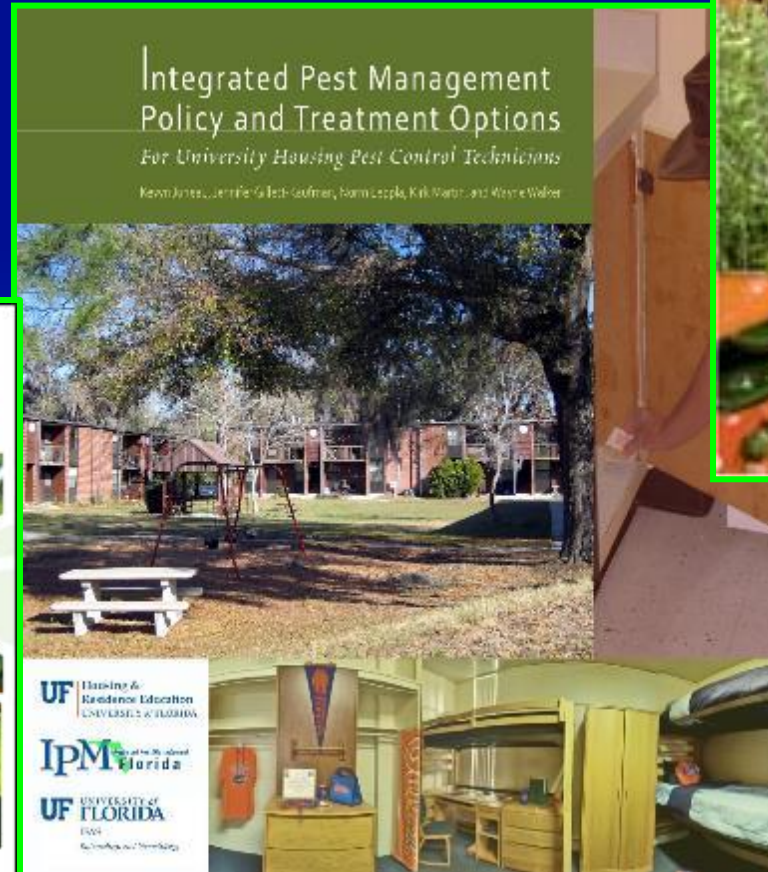
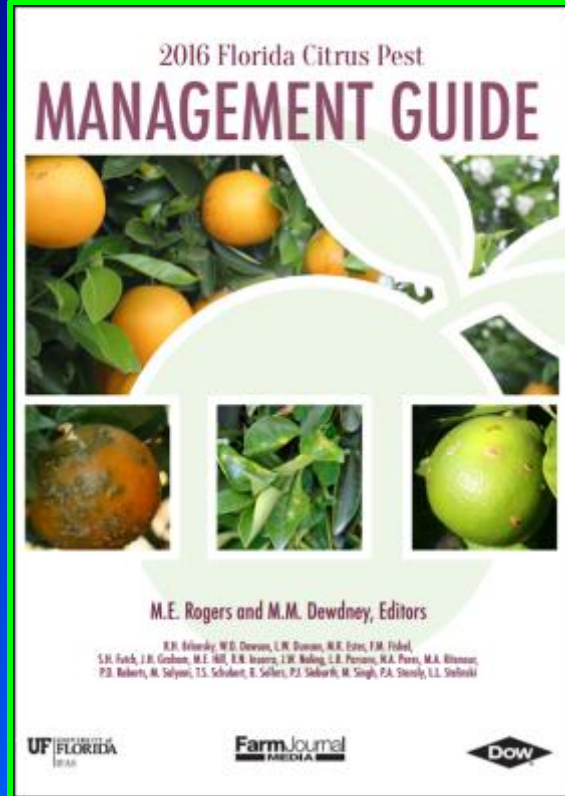
## Mole Cricket IPM

- ✓ Use tolerant grass cultivar or species
- ✓ Maintain healthy grass
- ✓ Perform routine soil testing- fertilizer or lime
- ✓ Reduce watering during winter months
- ✓ Plant nectar sources for Larra wasps
- ✓ Eliminate lights during evening
- ✓ Sample regularly for mole crickets
- ✓ Apply insecticides if threshold exceeded
- ✓ Target and map infested areas- spot treat
- ✓ Rotate insecticide classes
- ✓ Keep records

- 1. Identify pests correctly**
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# IPM Guides





# Electronic Data Information Source (EDIS)

- Agriculture 
- Community Development
- Environment
- Families & Consumers
- 4H Youth development
- Lawn & Garden
- Aquaculture
- Crops
- Livestock
- Nursery & GH
- Organic farming
- Agricultural safety
- Small farms
- Turf & sod

7,000+ publications

<http://edis.ifas.ufl.edu/>



Featured Creatures provides in-depth profiles of insects, nematodes, arachnids and other organisms. The site is a cooperative venture of the University of Florida, IFAS, Entomology and Nematology Department and the Florida Department of Agriculture and Consumer Services, Division of Plant Industry.

*Common Name*

*Scientific Name*

*Recent Additions*

*Crop or Habitat*

*Higher Classification*

<http://entnemdept.ufl.edu/creatures/>

# Pesticide Information Office

Pesticide Information ▾ Laws and Regulations ▾ Integrated Pest Management For Applicators Pesticide Exams ▾ CEUs ▾

Exam Administrators

<https://pested.ifas.ufl.edu/>



**IFAS Extension  
Bookstore**

Dr. Jason Ferrell (Jay)





# Pest Management University



- Termite Training
- General Household Pest (GHP) Training
- Landscape & Ornamental (L&O) Pesticide Training



Dr. Faith Oi



<https://pestmanagementuniversity.org/>

# University of Florida Plant Medicine Program

## Teaching IPM to Future Plant Doctors



Dr. Amanda Hodges

<http://dpm.ifas.ufl.edu/>



# IPM Florida

- ▶ **IPM Florida**
  - IPM Florida Personnel
  - Purpose of Website
  - IPM Florida Documents
  - IPM Projects
  - IPM Florida Partners
  - IPM Funding
  - IPM-Related Organizations
  - IPM Florida ListServ
- ▶ **Extension/Education**
  - Extension Resources
  - IPM Education and Training
  - Photo Galleries
  - Presentations
  - Publications
  - Videos
  - Video Classics
- ▶ **Agricultural IPM**
  - Forage
  - Field Crops
  - Greenhouse Crops
  - Vegetable Crops
  - Fruit Crops
  - Ornamentals
  - Pastures, Turf and Sod
  - Livestock
  - Organic and Sustainable
  - Other Crops
- ▶ **Community IPM**
  - Biting, Stinging, Nuisance Pests
  - Household IPM
  - Landscape IPM
  - Home Gardening IPM
  - Public Health IPM
  - Institutional IPM
- ▶ **Environmental IPM**
  - Invasive Arthropods
  - Invasive Diseases
  - Invasive Plants
  - Invasive Species
- ▶ **Applying IPM**
  - IPM Planning/Guides
  - Scouting
  - Pest Identification and Diagnosis
  - Pest Management Methods
  - IPM Adoption
  - Thrips IPM Program
  - Insect Rearing
  - Area-wide IPM and SIT
- ▶ **Additional Information**
  - Southern States IPM Websites
  - EDIS
  - Crop Profiles
  - Pest Management Strategic Plans
  - Solutions for your Life
  - eXtension

**UF UNIVERSITY OF FLORIDA** IFAS Extension **IPM Florida** Integrated Pest Management **SOLUTIONS for your LIFE**

Home IPM FL Extension/Education Agricultural Community Environmental Applying IPM Search

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**Whitefly IPM**

**Guidelines for Purchasing Natural Enemies**

**Love Bug IPM**

**Living Extension IPM Field Laboratory**

**Mole Crickets**

**Community IPM**

**Additional IPM Information**

National Institute of Food and Agriculture IPM Program

Regional IPM Centers:

- National Funding Opportunities
- National Pest Management Strategic Plans & Crop Profiles
- Southern IPM Center - Current News
- Southern IPM Center - Employment

State IPM Programs

UF/IFAS Centers and Programs:

- Center for Landscape Conservation & Ecology
- Center for Sustainable and Organic Food Systems
- Extension Offices and Research and Education Centers
- School IPM Information Source
- Small Farms and Alternate Enterprises
- Solutions for Your Life (SFYL)

eXtension:

- Implementing Urban IPM

The University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) IPM Program, IPM Florida, provides statewide, interdisciplinary and inter-unit coordination and assistance for UF, IFAS integrated pest management research, Extension and education.



# Additional IPM Information & Education

- Florida-Friendly Landscaping- <https://ffl.ifas.ufl.edu/>
- Landscaping Contract- <https://edis.ifas.ufl.edu/pdffiles/EP/EP34700.pdf>
- UF/IFAS Academic Departments, Research and Education Centers- <https://ifas.ufl.edu/> (Dr. Adam Dale, Turfgrass and Ornamental Entomology)
- Pesticide Applicator Training- County Extension Office- <https://ifas.ufl.edu/>
- Florida Nursery, Growers, and Landscape Association (FNGLA) Certified Professional in six areas- <http://www.fn gla.org/>
- Urban Landscape Summit Center for Land Use Efficiency <http://CLUE.ifas.ufl.edu>
- FDACS, DPI Pest Alerts & Circulars- <https://www.fdacs.gov/Divisions-Offices/Plant-Industry/Plant-Industry-Publications/Pest-Alerts>



<http://ipm.ifas.ufl.edu>