

Integrated Pest Management Education and Applications

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University of Florida



IPM for Certified Crop Advisors

- IPM Definition and Concepts
- Plant Medicine Program
- Entomology and Nematology Department
- Extension Training Programs
- Pesticide Information Office
- IPM Florida Program

A Comprehensive Definition of IPM

IPM is the **coordinated** use of pest and environmental **information** and **available** pest control **methods** --- to **prevent unacceptable levels** of pest **damage** by the most **economical** means --- with the **least possible hazard** to people, property and the environment.

IPM Actions

- Scouting
- Diagnosis
- Thresholds
- Management
- Evaluation

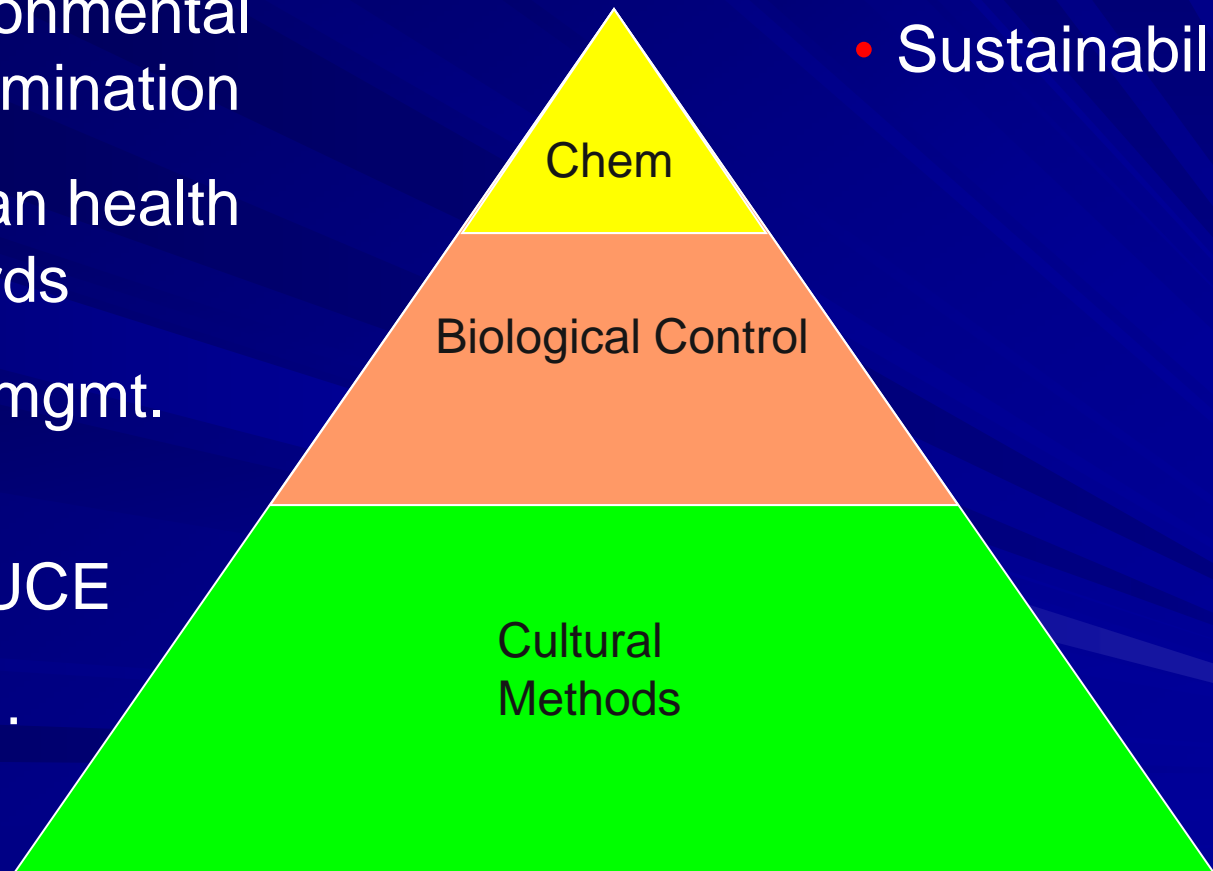


IPM System

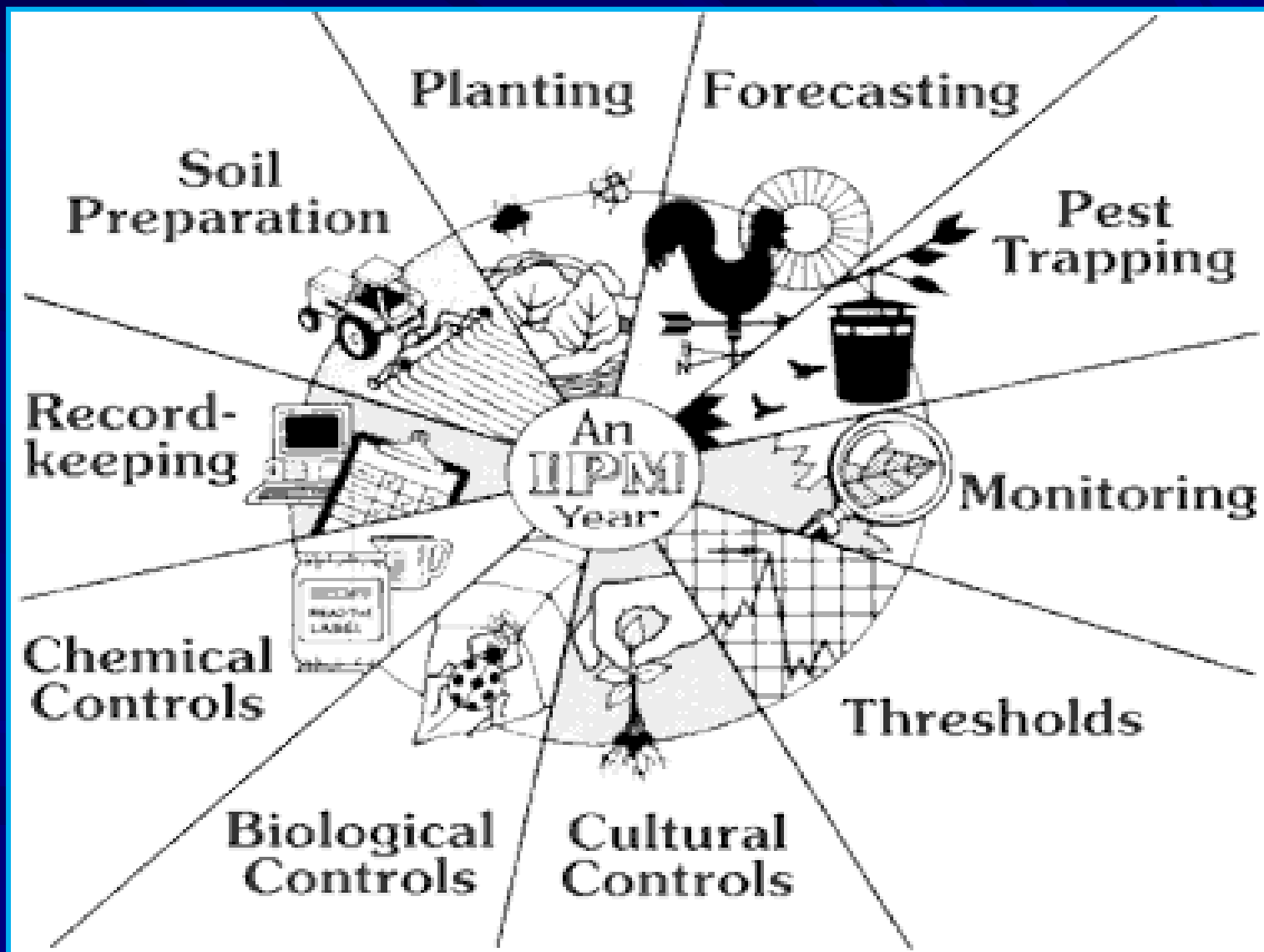
- 
- Pest outbreaks & disease epidemics
 - Environmental contamination
 - Human health hazards
 - Pest mgmt. costs
 - **REDUCE RISK...**

INCREASE...

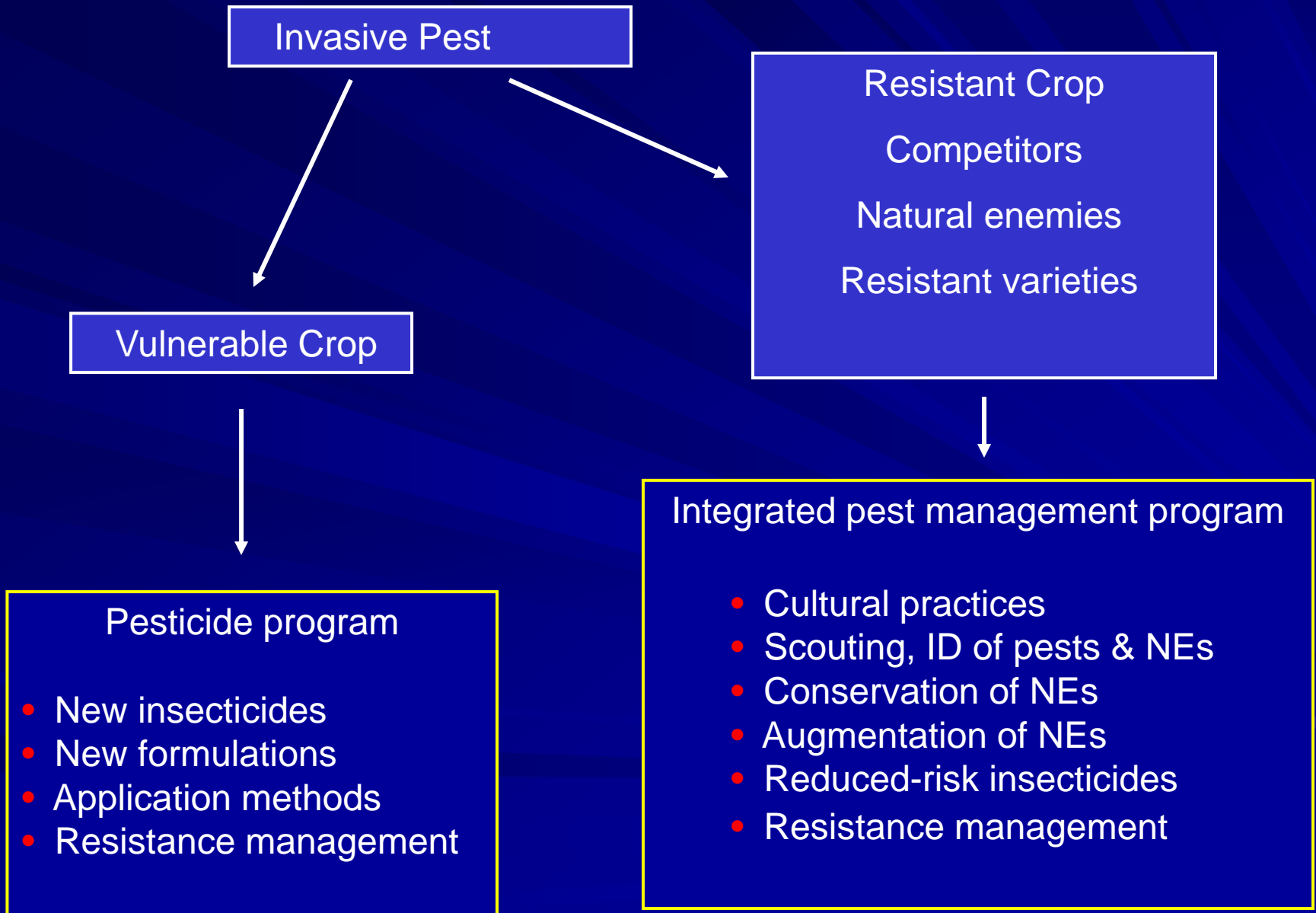
- Reliability
- Sustainability



IPM Practices



IPM Transition



Invasive Pest

Vulnerable Crop

Pesticide program

- New insecticides
- New formulations
- Application methods
- Resistance management

Resistant Crop
Competitors
Natural enemies
Resistant varieties

Integrated pest management program

- Cultural practices
- Scouting, ID of pests & NEs
- Conservation of NEs
- Augmentation of NEs
- Reduced-risk insecticides
- Resistance management



Where is IPM practiced?

Sustainable IPM Systems

- Economic profitability
- Environmental health
- Social and economic well-being

IPM Education and Training

- Identifying key pest and beneficial organisms
- Understanding the ecology and adaptability of the organisms
- Mastering scouting and other monitoring techniques
- Applying economic and other action thresholds
- Preventing pest outbreaks through habitat manipulation
- Designing systems of mitigation that minimize environ. impact
- Experience with the habitat, e.g., crops or buildings
- Understanding laws and regulations pertinent to pest mgmt.
- Familiarity with the safe and appropriate use of pesticides
- Exposure to pest management information and organizations

IPM Competencies

- Education & experience. An **interdisciplinary education** in the traditional scientific disciplines plus hands-on, **practical experience** are essential.
- Synthesis & integration. Education and training prepare pest managers to **synthesize knowledge** from across disciplines because plant health problems often are not limited to a single cause.
- Problem solving & critical thinking. Experience is gained in accurately **diagnosing and rapidly solving** plant health problems while minimizing environmental impacts and economic losses.
- Speaking & writing effectively. Superior **communication skills**, both written and verbal, are required to effectively communicate IPM principles and practices.

University of Florida Plant Medicine Program

*Teaching IPM To Future
Plant Doctors*



Director:
Dr. Robert
McGovern

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

Mission

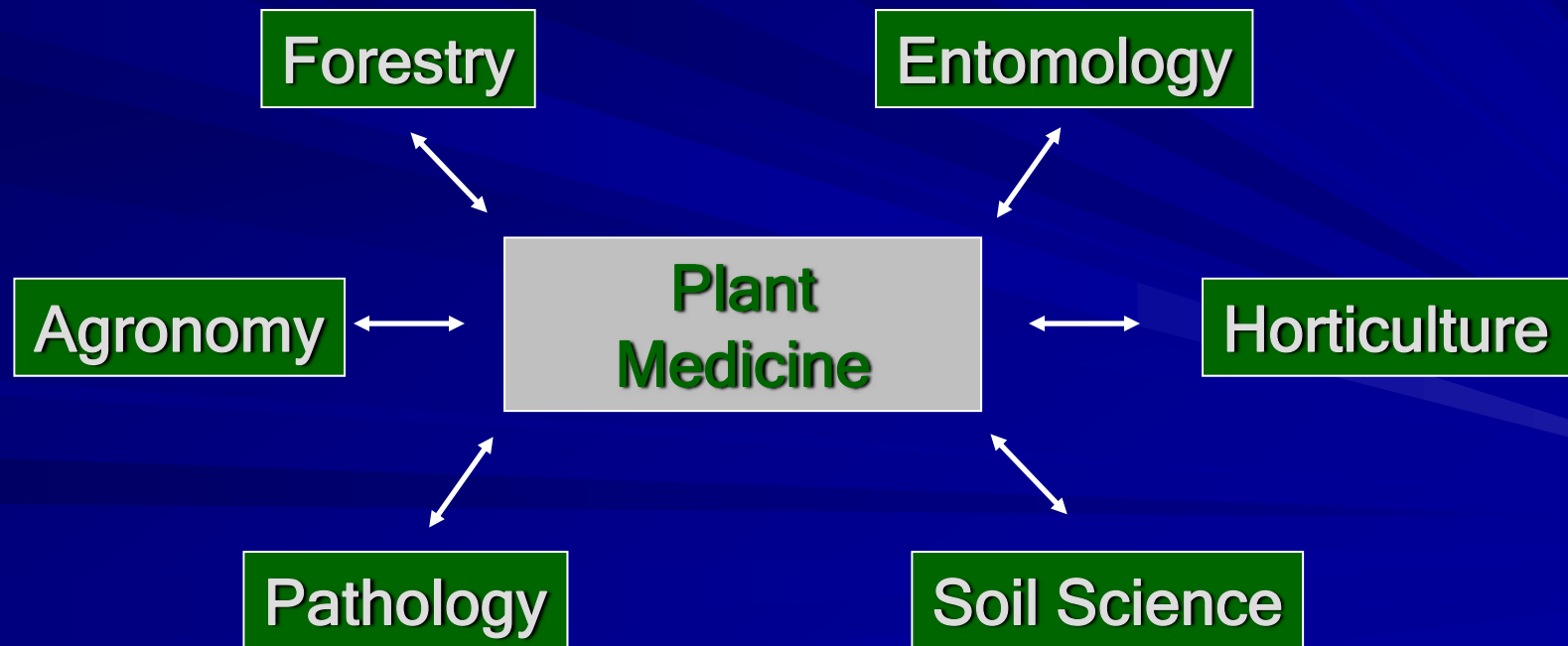


Plant Doctors are helping to achieve maximum crop yields to feed a hungry world while sustaining the environment. Thus, Plant Medicine could become agriculture's most important degree program for protecting crops.

1999- The Doctor of Plant Medicine (D.P.M.) degree is for practitioners, ***Plant Doctors***, trained in all aspects of the prevention, diagnosis and management of plant health problems.

Impacts of the Plant Medicine Program on Agricultural Science

Changes the educational paradigm through integration



Future Plant Doctors



- ❁ B.S. in agriculture or related science, 1/3 M.S.
- ❁ ≥ 3.0 (“B”) grade point average
- ❁ ≥ 1000 GRE (combined verbal + quantitative)
- ❁ ≥ 550 (paper test) or 213 (computer) TOEFL

Student Advisement and Examinations

- ❖ Students guided by a three member Supervisory Committee (Entomologist/ Nematologist, Plant Pathologist, Plant/Soil Scientist).
- ❖ Standardized written examination consisting of three sections (Entomology/Nematology, Plant Pathology, Plant/Soil Science). Each examination is 8 hrs and passing is 80%.
- ❖ Oral examination administered by a student's Supervisory Committee.

Plant Medicine Program

A unique, multidisciplinary 3 to 4-year course of study requiring **120 credit hours** of coursework and internships. Research and dissertation not required for the **D.P.M. degree.**



Core Courses

Department	Credits
Plant, Soil & Weed Science	21-22
Entomology & Nematology	22
Plant Pathology	19
Other (Agric. Law, Integrated Plant Medicine, etc.)	13
Total	75-76



**90 credits
required
(core plus
electives)**

Internships

90 credits of coursework + 30 internship credits = 120 credits in all relevant disciplines



Careers for Plant Doctors (50)

Consulting



Research



Diagnostics



Teaching

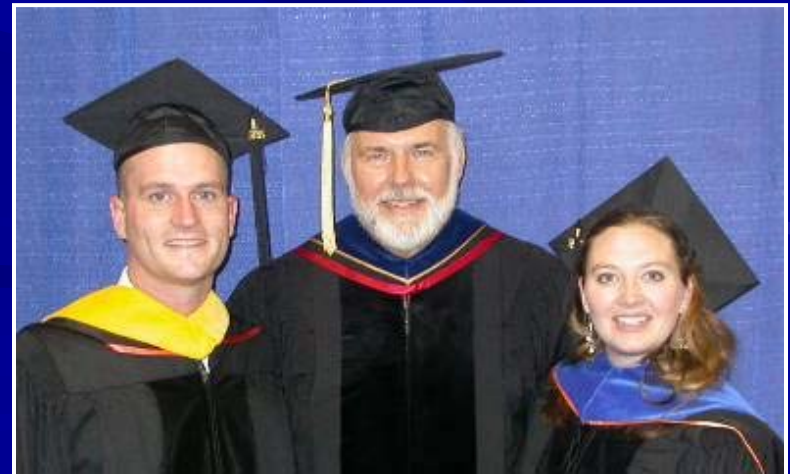


Extension

Regulatory

IPM Florida Graduates

- Javier Garces- Professor and Program Director, Valencia Community College
- Stephanie Bledsoe- Director of Training and Technical Services, Massey Services
- Dan Sonke- Program Manager, Protected Harvest; Senior Scientist, SureHarvest
- Esther Serrano- Plant Pathologist, USDA, APHIS



Dr. Denise Thomas
Doctor of Plant Medicine



Applied Biologist
U.S. Naval Facilities
Engineering Command
Norfolk, VA

Dr. Brian Jackson
Doctor of Plant Medicine



Agronomist
USDA-National Resources
and Conservation Service
Euphrata, WA

UF, CALS, Entomology and Nematology Department

Urban Pest Management*

Plant Protection*



Pre-professional
Studies

Biology
Education

Basic Sciences

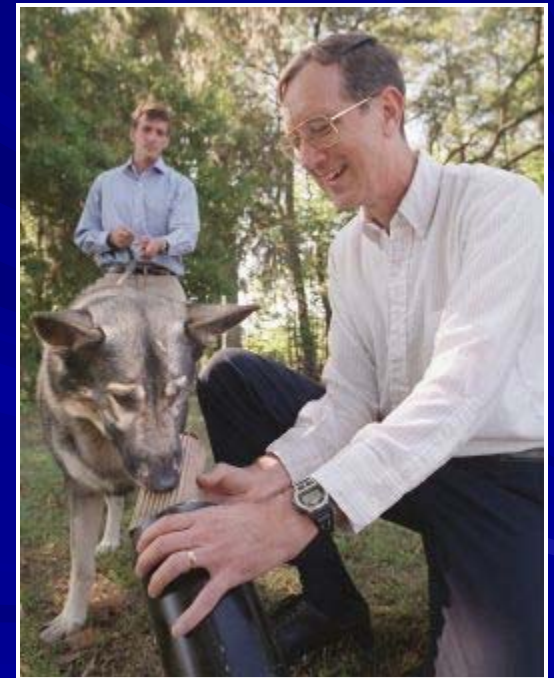
Ecotourism

Pest Management Courses on Campus or RECs

- Capinera- ENY 5231 Insect Pest and Vector Mgmt.
- Cave- PMA 3010 Fundamentals of Pest Management
- Crow- NEM 6708 Field Plant Nematology
- Liburd- PMA 4570C, PMA 6228 Field Techniques in IPM
- McSorley- ALS 3153, ALS 5136 Agricultural Ecology
- Kern- ENY 3228, ENY 5228 Urban Vertebrate Pest Mgmt.
- Koehler- ENY 4228 Pesticide Application, ENY 5222C Biology and ID of Urban Pests, ENY 5226C Principles of Urban Pest Management



Urban Pest Management (Urban IPM)- Phil Koehler



Certificate in Urban Pest Management

(15 credits from this list of courses)

- Principles of Entomology/Graduate Survey of Entomology (2)
- General Entomology Laboratory (1)
- Insect Classification (3)
- Insect Pest and Vector Management (3)
- Principles of Urban Pest Management (2)
- Urban Pest Management Laboratory (1) or
 - Urban Pests: Structural (2)
 - Urban Pests: Structural Laboratory (1)
- Biology and Identification of Urban Pests (2)
- Biology and Identification of Urban Pest Laboratory (1) or
 - Urban Pests: Bite/Sting (2)
 - Urban Pests: Bite/Sting Laboratory (1)
- Medical and Veterinary Entomology (3)
- Medical and Veterinary Entomology Laboratory (1)
- Urban Vertebrate Pest Management (2)

Certificate in Landscape Pest Management

(15 credits from this list of courses)

- Principles of Entomology/Graduate Survey (2)
- General Entomology Laboratory (1)
- Insect Pest and Vector Management (3)
- Fundamentals of Pest Management (3)
- Fundamentals of Plant Pathology (3/4)
- Landscape IPM: Ornamentals and Turf (3)
- Tree and Shrub Insects (3)
- Principles of Nematology (3)

Urban IPM Curriculum

■ Entomology Courses

- Princ. of Entomology
- Insect Classification
- Fund. of Pest Manag.
- Biol. & Id. of Urban Pests
- Princ. of Urban Pest Manag.
- Urban Pesticide Application
- Medical & Vet Entomology
- Principles of Nematology

■ Allied Courses

- Food Microbiology
- Fund. of Plant Pathology
- Envir. Plant Ident. & Use
- Turfgrass Culture
- Weed Science
- Landscape and Turfgrass Management
- Food Safety and Sanitation
- Construction Materials
- Construction TechniquesBSuperstructures

■ Business Courses

- Princ. of Agribusiness Mgmt
- Human Resources Mgmt in Ag Business
- Agricultural Law
- Principles of Marketing

University of Florida's
12th Annual
Southeast
Pest Management
Conference

American Idols of Pest Control



That was
BRILLIANT!

You
knocked
'em dead!

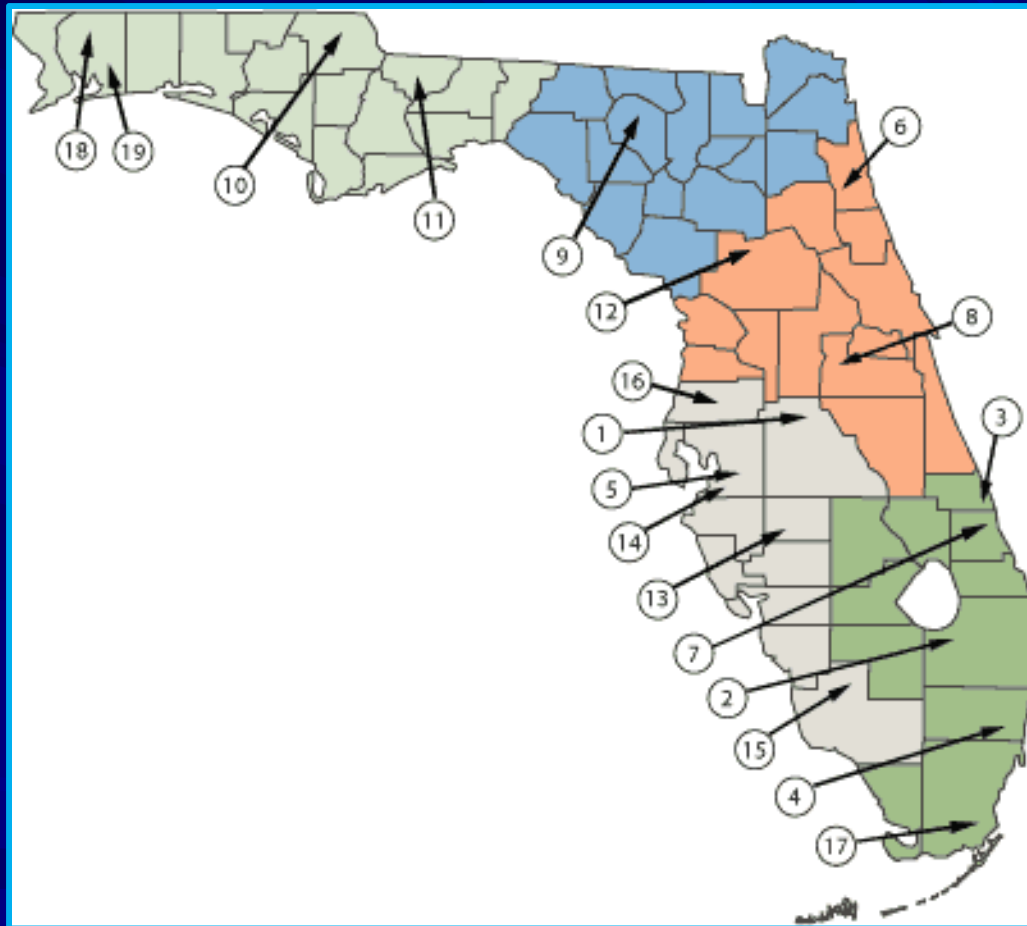
You can
SPRAY, dawg!

Phil

Eileen

Roberto

Certificate Programs at RECs



<http://solutionsforyourlife.ufl.edu/map/>

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

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





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UF FLORIDA
IFAS Extension

A vertical advertisement with a blue background. It features a collage of images including a person in a hard hat, a person in a lab coat, a person holding a flower, a person in a white protective suit, a tractor in a field, and a laptop displaying a pink flower. The text 'UF/IFAS. Serving up quality, convenient training. www.onlinepesticideCEUs.com Earn instant CEU credits online.' is prominently displayed. The UF/IFAS logo is in the bottom right corner.

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

onlinepesticideceus.com

- Pesticide Labeling
- Noxious Weeds in Florida
- Pesticide Formulations
- Pest Management and Pesticides
- Control of Woody Brush
- Pesticide Hazards and First Aid
- Pesticides in the Environment
- Personal Protective Equipment
- Natural Areas Weed Control
- Understanding Pesticide Resistance
- Principle of Rights of Way Pest Control I
- Principle of Rights of Way Pest Control II
- Principles of Pesticides: Herbicides I
- Principles of Pesticides: Herbicides II
- Principles of Pesticides: Herbicides III

UF UNIVERSITY of
FLORIDA
IFAS Extension

Pesticide
Information Office

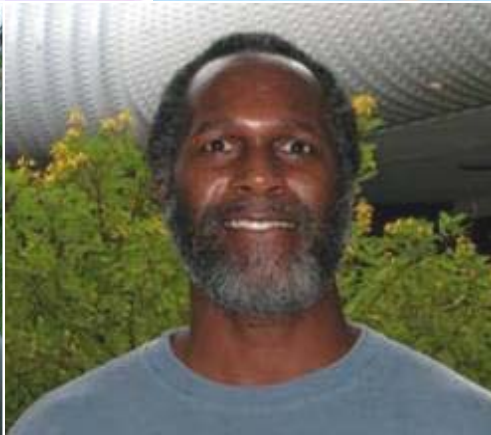
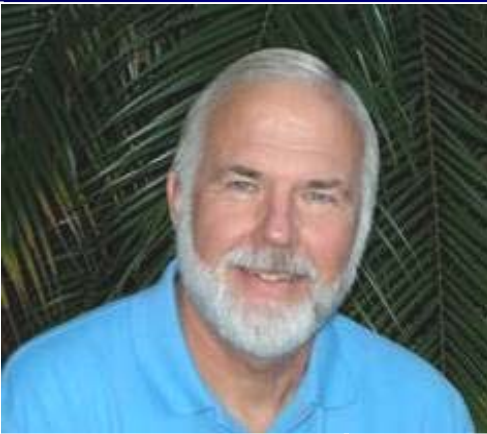
SOLUTIONS
for *your* LIFE

IFAS Extension
Bookstore

Florida Department of Agriculture
and Consumer Services



IPM Florida provides statewide, interdisciplinary
and inter-unit coordination and assistance for
UF/IFAS integrated pest management research
Extension and education faculty



IPM Education and Training

▶ IPM Resources

About Us, Contact Us, Links, FAQ's, Success Stories, Projects, Reports, Extension Resources, Training, UF/IFAS Grants Program, Funding, Employment, ListServ

▶ Agricultural IPM

Citrus, Field Crops, Greenhouse, Herbs, Livestock, Non-Citrus, Ornamental, Sustainable and Organic, Turf, Vegetables

▶ Community IPM

Landscape IPM, Home Gardening, Master Gardener, School IPM, Structural IPM

▶ Natural Areas IPM

Weeds, Arthropods, Animals

▶ Applying IPM

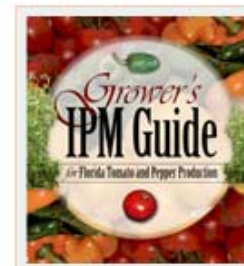
IPM Planning, Scouting, Methods, Pest

Thrips Pest Management

- **Thrips 101**
- Scouting
- Identification of thrips
- Identification of natural enemies of thrips
- General IPM practices that reduce thrips populations
- Thrips management in specific crops
- Challenges of thrips management
- Tracking thrips resistance to insecticides
- **Specialist working group**
- **Education and training activities**
- **Grower's IPM Guide for Florida Tomato and Pepper Production**
- **Grower's IPM Guide for Florida Tomato and Pepper Production Screensaver**
- **Links**

◀ [Vegetables Page](#)

◀ [Agriculture IPM Page](#)



Downloads

[Adobe Acrobat](#)

[Microsoft Powerpoint](#)

UF/IFAS Publications

[Agribusiness and](#)

Thrips Identification

- Proper species level identification can be difficult
 - small size (adult is $<1/10$ in.)
 - hand lens
 - dissecting scope
 - compound microscope
 - sample to Distance Diagnostic and Identification System (DDIS)
 - sampling either with aspirator or white paint board



Photo credit: Lance Osborne

Western Flower Thrips

Frankliniella occidentalis



Adult female



Larva

Can be confused with other species

Photo credits:
Joe Funderburk

Other Thrips Species



Florida flower thrips
Frankliniella bispinosa

Photo credit: Cheryle O'Donnell



Melon thrips
Thrips palmi

Photo credit: Kelly Sims



Tobacco thrips
Frankliniella fusca

Photo credit: Kelly Sims

Thrips Damage



Photo credit: Hank Dankers



Photo credit: Stuart Reitz

Completed Educational Activities

- Chilli thrips polycom training
- Thrips identification and sampling training
- Florida Landscape and Ornamental Thrips Workshop
- Polycom meeting of statewide thrips specialists at UF



Extension Programs

- In-service training
- Field days
- Classroom education
- Diagnostic training



Information on IPM Education and Applications

IPM  **Integrated Pest Management**
Florida

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