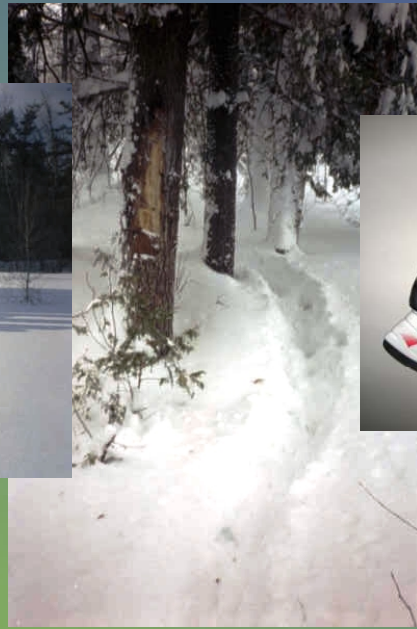


***Strengthening Integrated Pest  
Management in  
University of Florida  
Structures and Landscapes***

**Kevyn J. Juneau**





Florida  
or  
Bust



# Urban Pests. . .

# . . .what are they?

**Pest: a plant or animal detrimental to humans or human concerns**

# Urban Pests. . .

. . .what are they?

**Pest: a plant or animal detrimental to humans or human concerns**

**Organisms that are economically, medically, or aesthetically important**

# Urban Pests. . .

. . .what are they?

Include...

- Insects
- Plants
- Wildlife



Images: wikipedia.com

**Urban Pests. . .**

**. . . what's the big deal?**

# Urban Pests. . .

. . . what's the big deal?

- Structure damage



# Urban Pests. . .

. . . what's the big deal?

- Health risks
  - ▶ Disease vectors
  - ▶ Allergens
  - ▶ Bites or stings
  - ▶ Psychosomatic





**Urban Pests. . .**

**. . . what do we do about them?**

Urban Pests. . .

. . . what do we do about them?

**Get rid of them!**

# Urban Pests. . .

## . . . what do we do about them?

### - Pesticides

- ▶ Historically been the preferred method
- ▶ Quick and easy to use
- ▶ Immediate results



# Urban Pests. . . . . . what do we do about them?

## - Pesticide misuse

- ▶ Costly
- ▶ Health risks
- ▶ Resistance
- ▶ Unsustainable

**"DDT is good for me-e-e!" zzz**

The great expectations held for DDT have been realized. During 1946, exhaustive scientific tests have shown that, when properly used, DDT kills a host of destructive insect pests, and is a benefactor of all humanity.

Pennsalt produces DDT and its products in all standard forms and is now one of the country's largest producers of this amazing insecticide. Today, everyone can enjoy added comfort, health and safety through the insect-killing powers of Pennsalt DDT products . . . and DDT is only one of Pennsalt's many chemical products which benefit industry, farm and home.

**GOOD FOR STEER**—Heef grows smaller nowadays . . . for it's a scientific fact that—compared to untreated cattle—heef-aisers gain up to 20 pounds extra when protected from horn flies and many other pests with DDT insecticides.

**KNOX FOR THE HOME**—helps you to make healthier, more comfortable homes . . . protects your family from dangerous insect pests. Use Knox-Oxal DDT Powders and Sprays as directed . . . then watch the bugs "bite the dust!"

**GOOD FOR FRUITS**—Bigger apples, sweeter fruits that are free from smut, worms . . . all benefits resulting from DDT dusts and sprays.

**GOOD FOR ROW CROPS**—25 more barrels of potatoes per acre . . . actual DDT treats have shown crop increases like this! DDT dusts and sprays help truck farmers pass these gains along to you.

**KNOX FOR DAIRIES**—Up to 20% more milk . . . more butter . . . more cheese . . . treat prove greater milk production when dairy cows are protected from the annoyance of many insects with DDT insecticides like Knox-Oxal Stock and Barn Spray.

**KNOX FOR INDUSTRY**—Food processing plants, laundries, dry cleaning plants, hotels . . . dozens of industries gain effective bug control, more pleasant work conditions with Pennsalt DDT products.

**PENNSALT**  
CHEMICALS

87 Years' Service to Industry • Farm • Home

PENNSYLVANIA SALT MANUFACTURING COMPANY  
WIDENER BUILDING, PHILADELPHIA 7, PA.

# Pest Control

...what are our options?

# Pest Control

...what are our options?



**IPM**

# Integrated Pest Management

## integrated pest management

Management of agricultural and horticultural pests that minimizes the use of chemicals and emphasizes natural and low-toxicity methods (Merriam-Webster Dictionary)

### Agricultural IPM

Scouting

Diagnosis

Thresholds

Management

# Integrated Pest Management

Expanding the movement to bring the IPM philosophy and practices to an urban environment

## Agricultural IPM

## Urban IPM

Scouting	—————→	Complaints, service calls & monitoring
Diagnosis	—————→	Assessment
Thresholds	—————→	Action levels
Management	—————→	Treatment & evaluation



# Integrated Pest Management

Pest management practices that focus on long-term **prevention** with the least amount of human and environmental health impacts by manipulating the **entire ecosystem**

# How IPM Works

Holistic approach to managing pests

# How IPM Works

Holistic approach to managing pests that depends on:

- **Education**
- **Communication**
- **Cooperation**

# How IPM Works

Holistic approach to managing pests that depends on:

- **Education** → **Pest control technician**
- **Communication** → **Resident**
- **Cooperation** → **Building manager & maintenance**

# How IPM Works

Holistic approach to managing pests that depends on:

- **Education** → **Pest control technician**
- **Communication** → **Resident**
- **Cooperation** → **Building manager & maintenance**

**Patience**

# How IPM Works

Components of an IPM program:

- Cultural control
- Mechanical control
- Biological control
- Chemical control

# How IPM Works

Components of an IPM program:

- Cultural control
- Physical control
- Biological control
- Chemical control

→ Sanitation

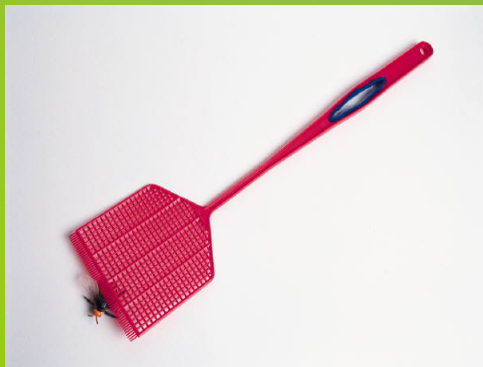
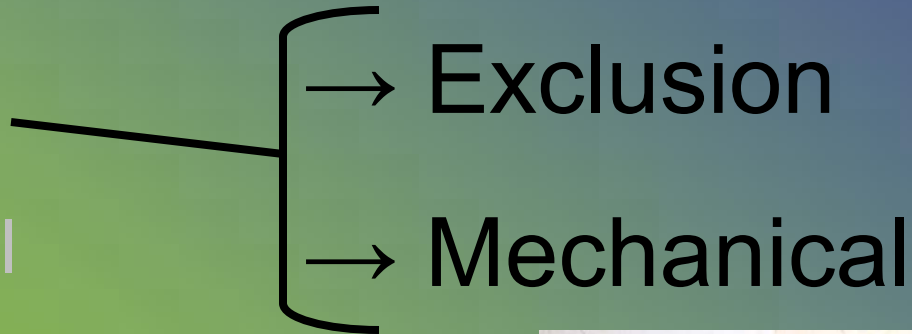
→ Tolerance



# How IPM Works

Components of an IPM program:

- Cultural control
- Physical control
- Biological control
- Chemical control

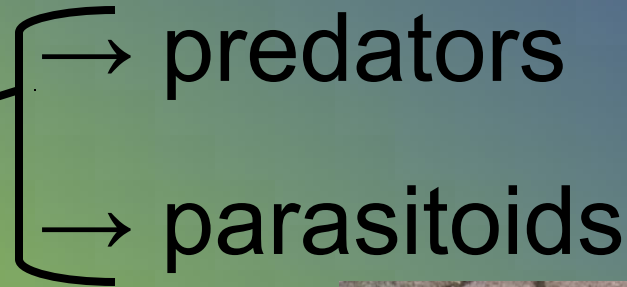




# How IPM Works

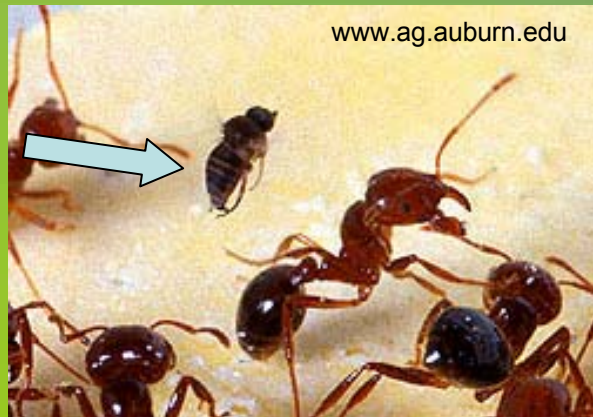
Components of an IPM program:

- Cultural control
- Physical control
- Biological control
- Chemical control



Google images

Phorid fly



Google images

# How IPM Works

Components of an IPM program:

- Cultural control
- Physical control
- Biological control
- Chemical control

**Responsible use**  
**of pesticides**

- Last resort
- Spot treatments
- Baits
- Rotation



# How IPM Works

Components of an IPM program:

- Cultural control
- Physical control
- Biological control
- Chemical control

- Soaps, detergents
- Botanicals
- Least-toxic pesticides



# IPM Programs

# IPM Programs

**Ascending levels of IPM**

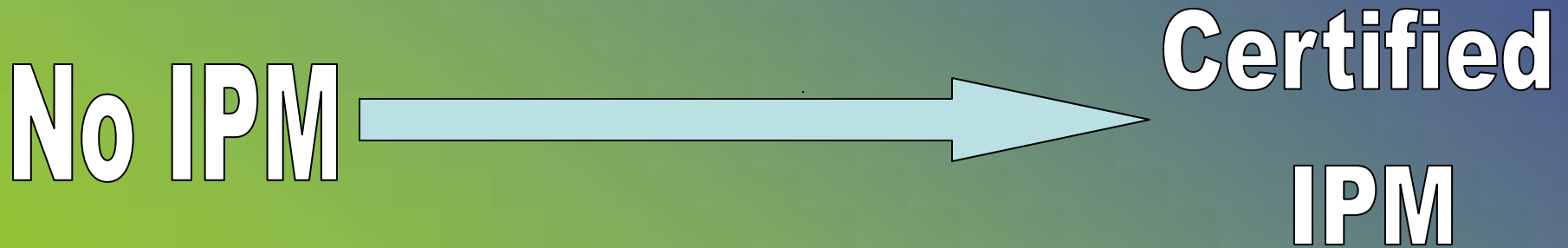
**No IPM**



**Certified  
IPM**

# IPM Programs

**Ascending levels of IPM**

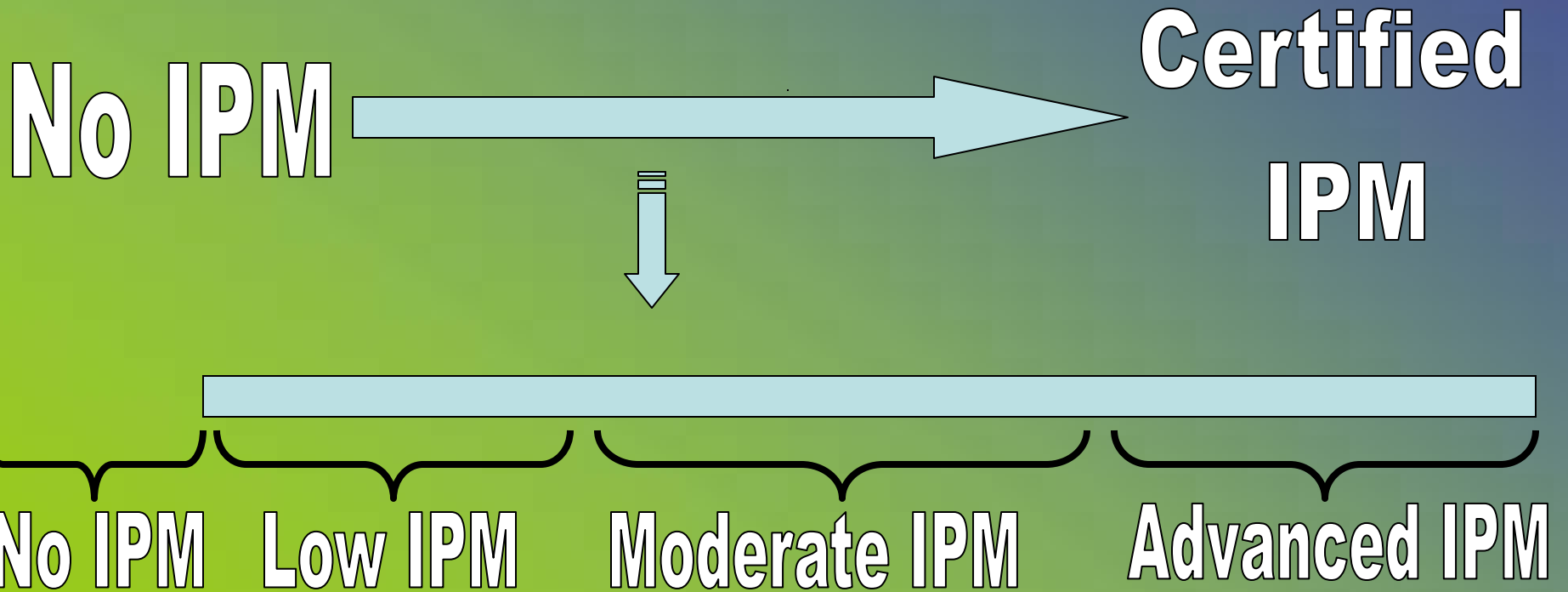


There is no distinction between  
varying levels of IPM

Only one level of certification

# IPM Programs

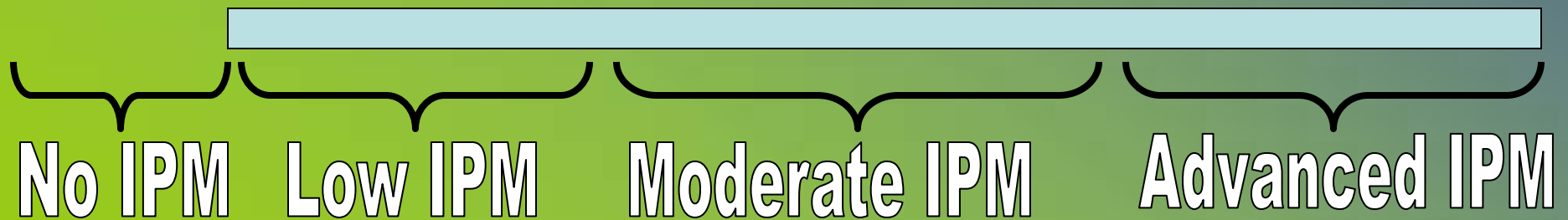
Ascending levels of IPM



# IPM Programs

**Ascending levels of IPM**

**Different levels of IPM for which to strive**





# IPM Programs

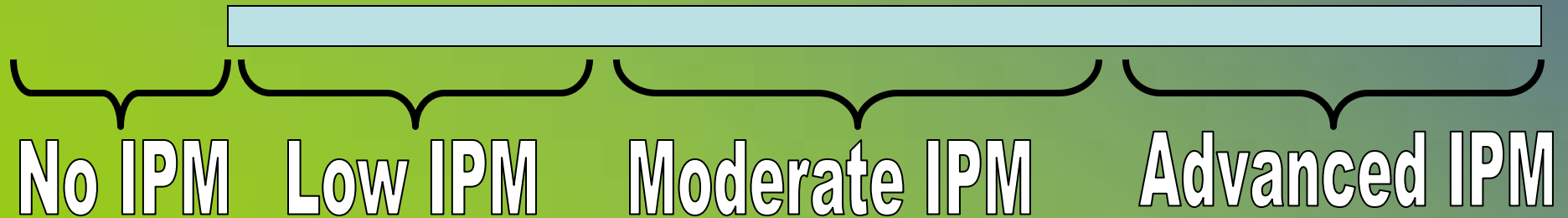
## Ascending levels of IPM

Conventional pest  
management practices

Few IPM practices  
utilized

Many IPM practices  
utilized

Documented  
IPM program



# Advanced IPM Program

- **Written IPM policy statement**
- **Identified IPM specialist**
- **Defined pest prevention practices**
- **Pest monitoring, ID & record keeping**
- **Written IPM protocols**
- **Rapid response & decision making process**
- **Use of non-chemical pest control strategies prior to responsible use of least-toxic pesticides**
- **Program evaluation**
- **Education**
- **IPM plan of action**

# Kevyn's Study

*Strengthening Integrated Pest  
Management in  
University of Florida  
Structures and Landscapes*

# IPM at UF

## Goals:

- Assess the sustainability of an IPM program that has been operational since 1997 in a UF-affiliated grade school
- Develop and test practices to advance IPM in UF Graduate and Family Housing
- Determine IPM methods for controlling the primary ant pest, *Brachymyrmex* spp.

# Part I

**IPM at P. K. Yonge  
Developmental  
Research School**

# IPM at P. K. Yonge School

**-Why IPM in grade school?**

# **IPM at P. K. Yonge School**

## **- Why IPM in grade school?**

- ▶ Schools are expected to provide a safe learning environment**
- ▶ Includes pest free environment**
- ▶ Children are more sensitive and have potentially greater exposure to pesticides**

# IPM at P. K. Yonge School

**-Why IPM in grade school?**

- ▶ **Federal and state regulations**
- ▶ **Community pressure**



# IPM at P. K. Yonge School

- Some background info about P.K.Y.



# **IPM at P. K. Yonge School**

**- Some background info about P.K.Y.**

**▶ K-12 grade School**

**▶ Alachua County School System**

**▶ Laboratory school associated  
with UF**

**▶ UF Environmental Health & Safety  
responsible for P.K.Y. pest control**

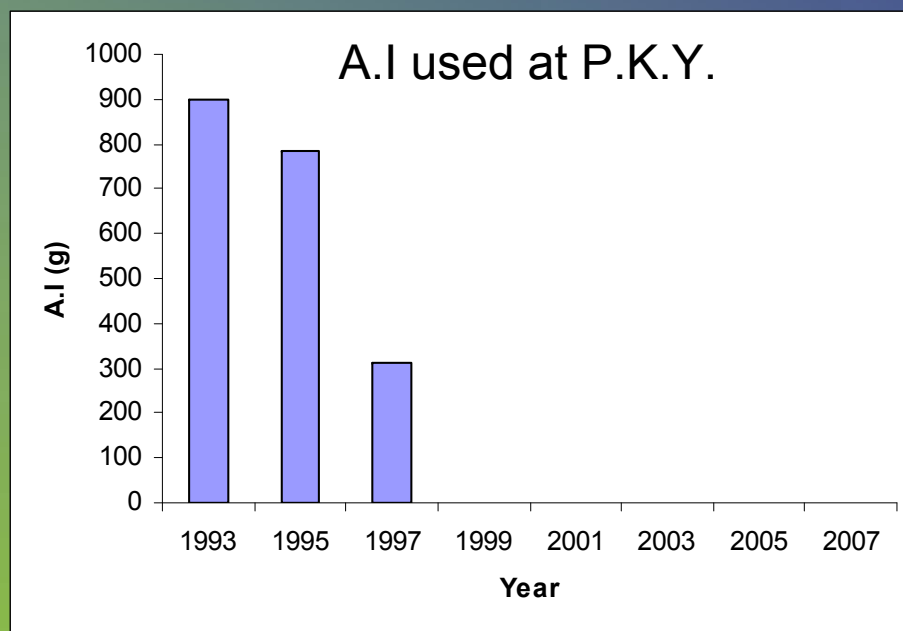
# Why IPM at P. K. Yonge School?

- ~1997 transition from calendar pesticide application to more IPM based approach

- Decrease in A.I used

- ↓ Organophosphates

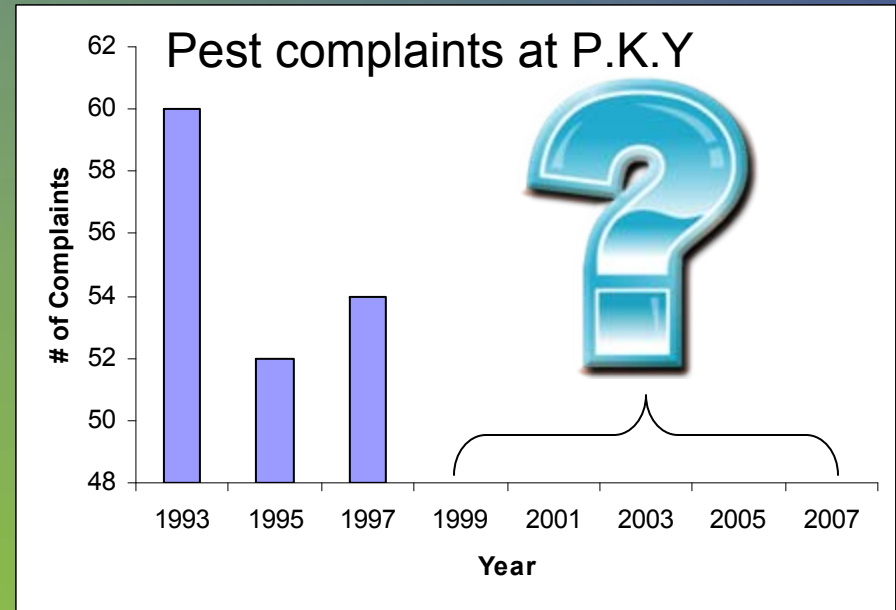
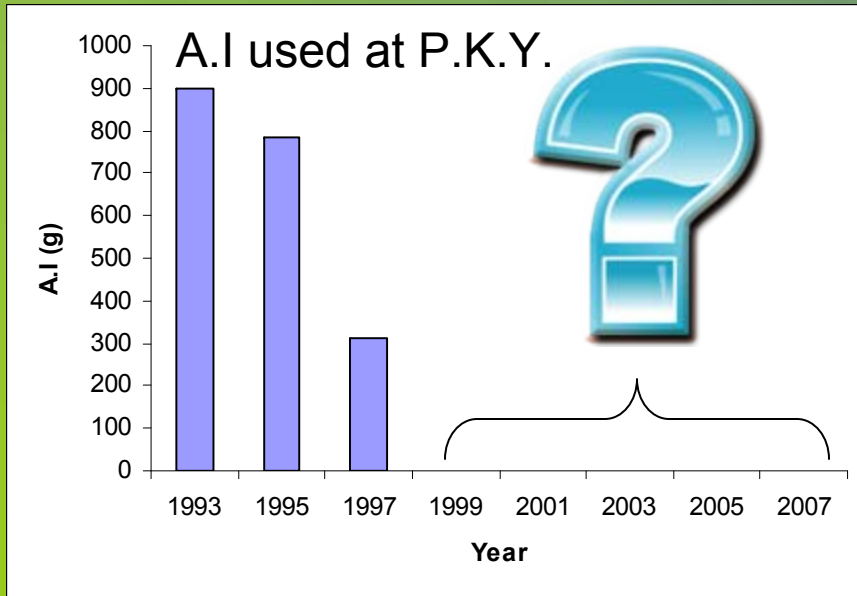
- ↑ Baits



Data from Scherer 2001

# IPM at P. K. Yonge School

**-10 year follow-up after completion of Clay Scherer's study**

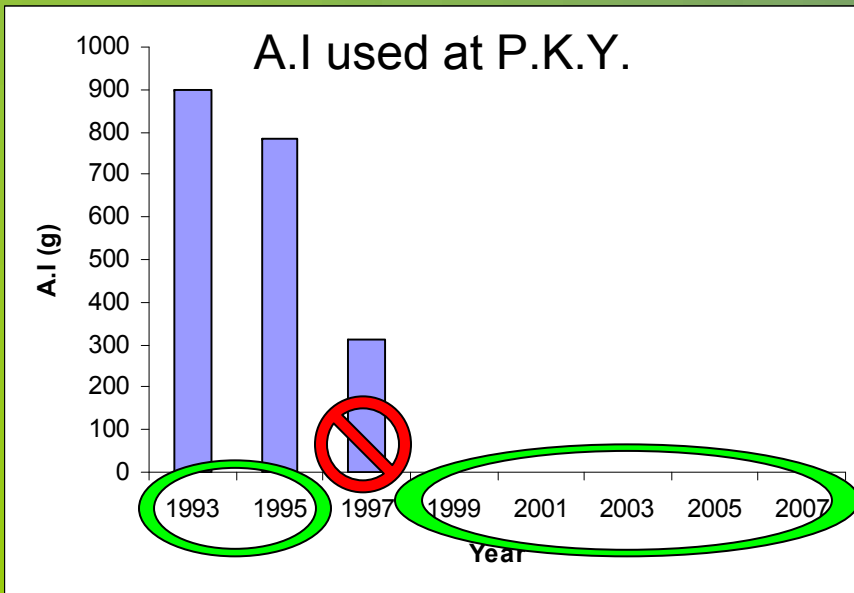


Data from Scherer 2001

# IPM at P. K. Yonge School

## What I plan to do:

- Extract data from EH&S' records for odd years between 1999 - 2007
- Compare them to Scherer's pre-1997 data



- 1997 data will not be used for comparison

# **IPM at P. K. Yonge School**

**Data collected from entire campus:**

- Pest complaints**
- Pesticide use**

**Hypothesis: after transition**

- Equal or fewer pest complaints**
- Sustained reduction of pesticide use**

# Part II

## IPM in Graduate and Family Housing

# IPM in UF Housing

## - Background information



**Study location:**

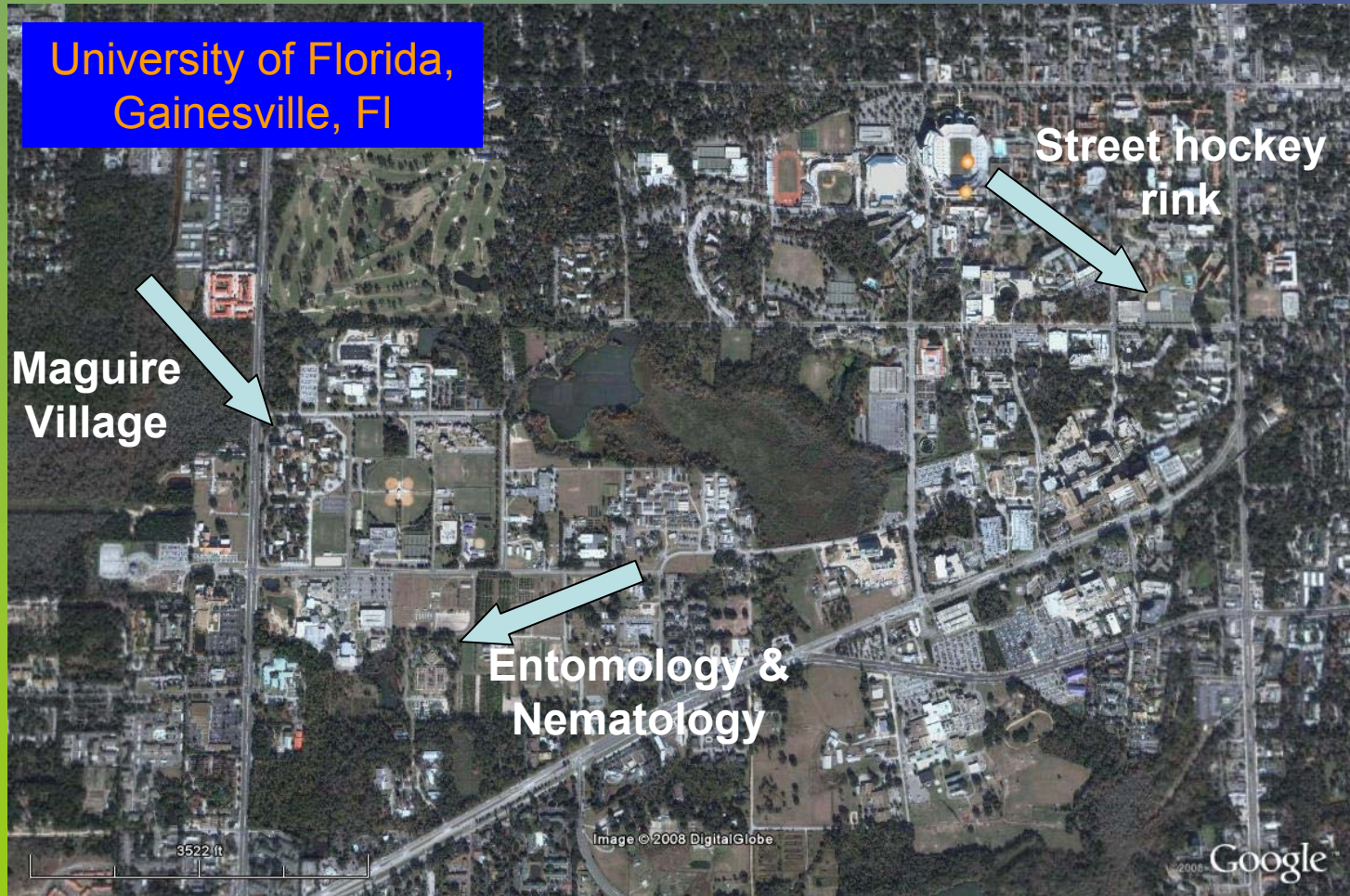
- Maguire Village
- Operated by  
Dept. of Housing  
and Residence  
Education





# IPM in UF Housing

## - Background information



# IPM in UF Housing

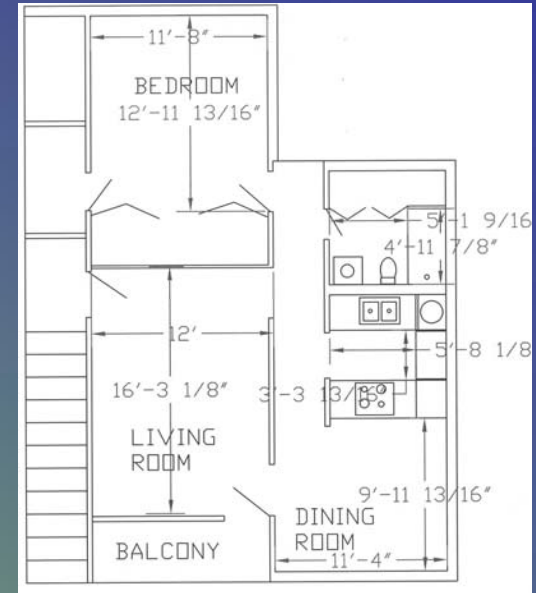
## - Background information

- 28 buildings

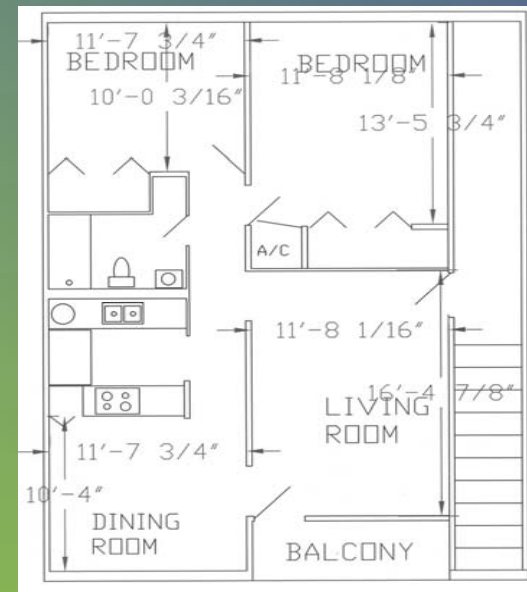
- 220 apartments

- Students & family members

- Upstairs & downstairs apartments



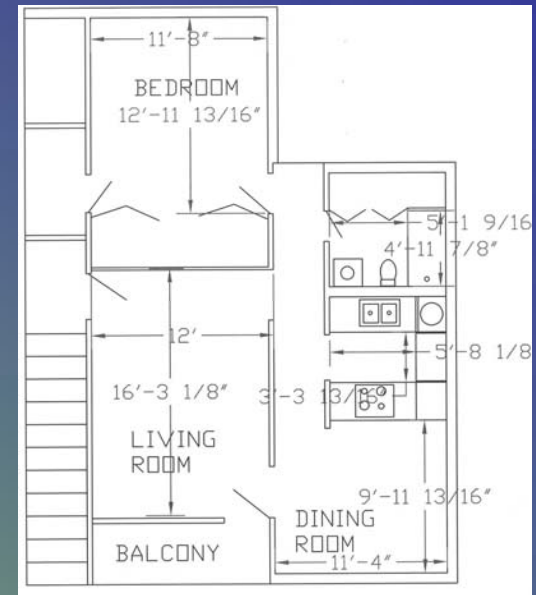
One bedroom apartment



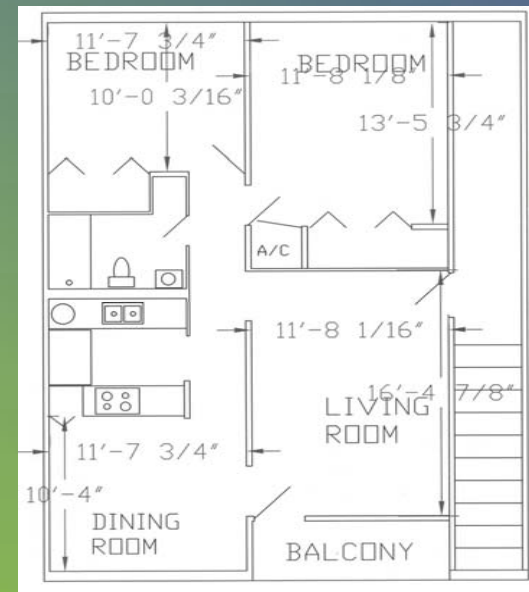
Two bedroom apartment

# IPM in UF Housing

- Background information
- Many foreign students
- Non-English speaking family members
- Children & babies



One bedroom apartment



Two bedroom apartment

# **IPM in UF Housing**

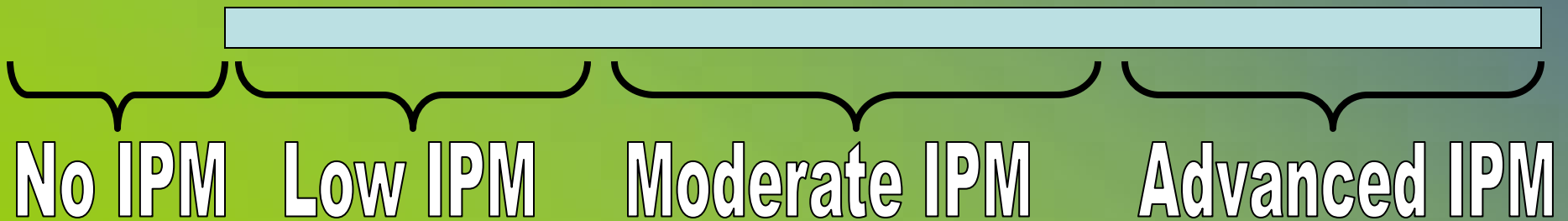
**What we plan to do: IPM**

- Implement an advanced IPM program in Maguire Village**
- Assess its efficacy**

# IPM in UF Housing

## Advanced IPM

- Written IPM policy statement
- Identified IPM specialist
- Defined pest prevention practices
- Pest monitoring, ID, and record keeping
- Written IPM protocols
- Rapid response and decision making process
- Use of non-chemical pest control strategies prior to responsible use of least-toxic pesticides
- Program evaluation
- Education
- IPM plan of action

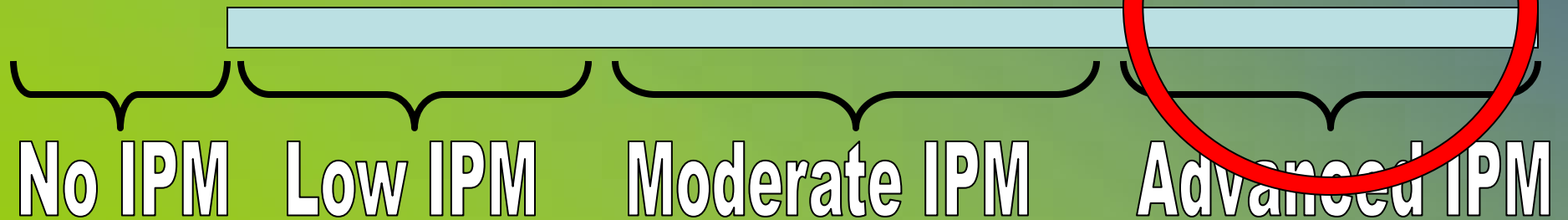
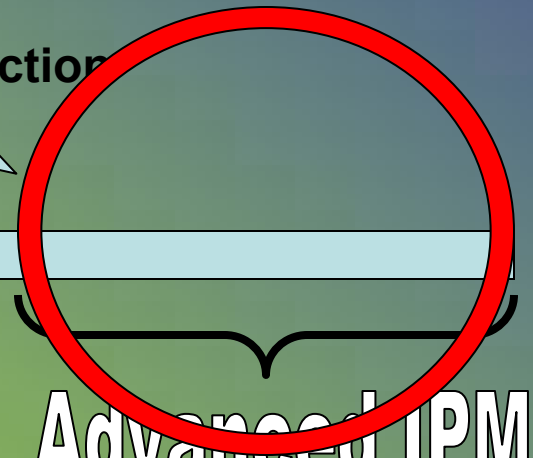
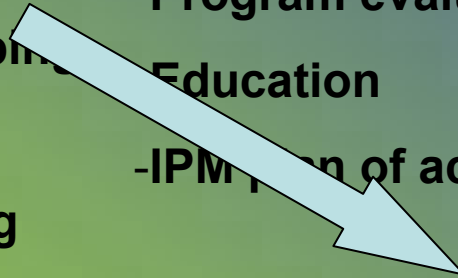


# IPM in UF Housing

## Advanced IPM

- Written IPM policy statement
- Identified IPM specialist
- Defined pest prevention practices
- Pest monitoring, ID, and record keeping
- Written IPM protocols
- Rapid response and decision making process
- Use of non-chemical pest control strategies and responsible use of least-toxic pesticides
- Program evaluation
- Education
- IPM plan of action

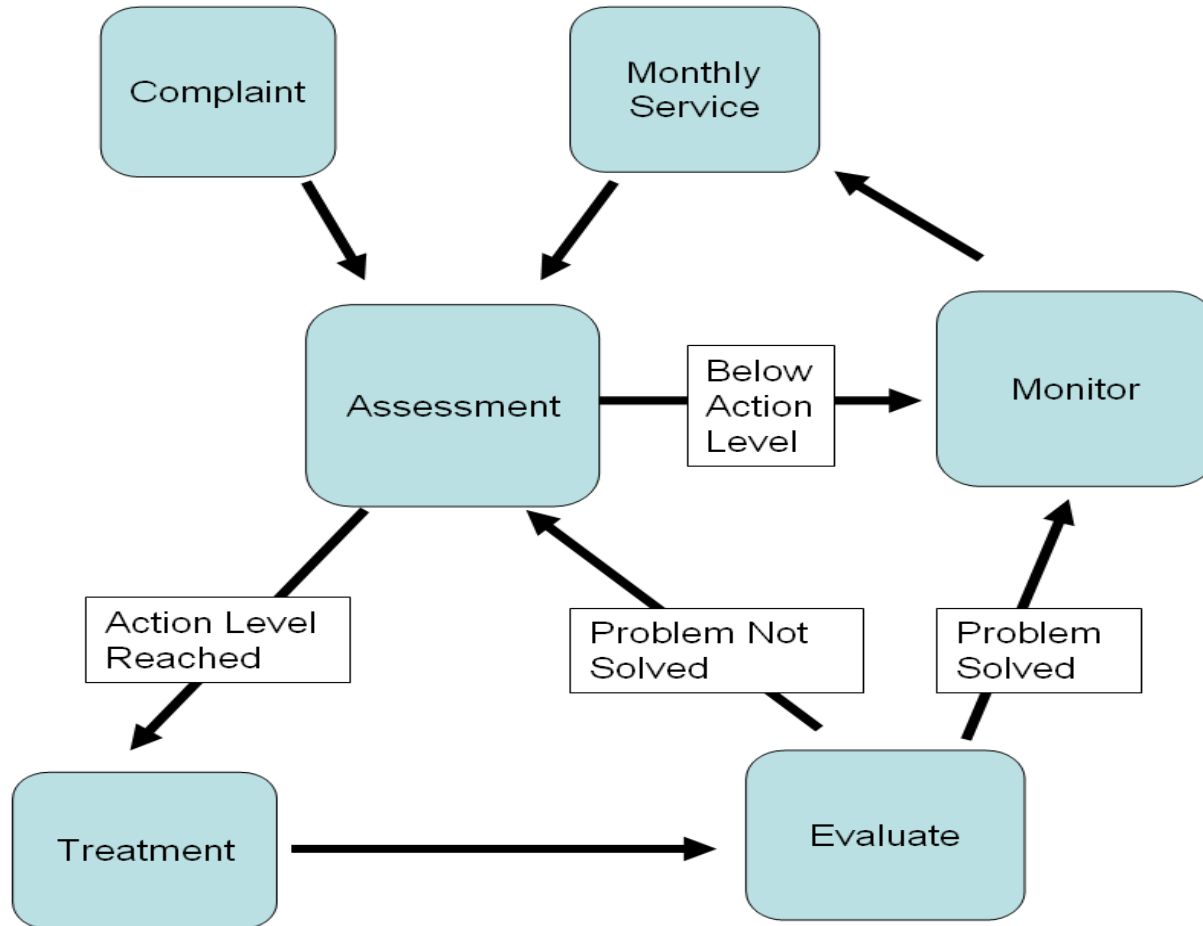
Where we want to be



# IPM in UF Housing

## Advanced IPM

Plan of action designed for urban setting



# IPM in UF Housing

**What we plan to do: data collection**

- 1. - Extract historical data from DHRE records from Jan 2004 – Dec 2007**
  - Compare to data collected between April 2008 – March 2009**

**Note: Jan - Mar 2008 = Transition to IPM**



# **IPM in UF Housing**

**What we plan to do: data collection**

- Pest complaints**
- Pesticide use**

**Hypothesis: after implementation**

- Equal or fewer pest complaints**
- Reduction of pesticide use**

# IPM in UF Housing

**What we plan to do: data collection**

**2. - Before and after inspection survey**

**▶ Maintenance issues**

**▶ Sanitation issues**

**▶ Evidence of pest activity**

# **IPM in UF Housing**

**What we plan to do: data collection**

- Before and after inspection survey**
  - ▶ Will document any issues that need to be addressed**
  - ▶ Will be compared to evaluate progress of program after one year**

# IPM in UF Housing

## Initial inspection survey results



# IPM in UF Housing

## Initial inspection survey results



# IPM in UF Housing

## Initial inspection survey results



# IPM in UF Housing

## Initial inspection survey results



# IPM in UF Housing

## Initial inspection survey results





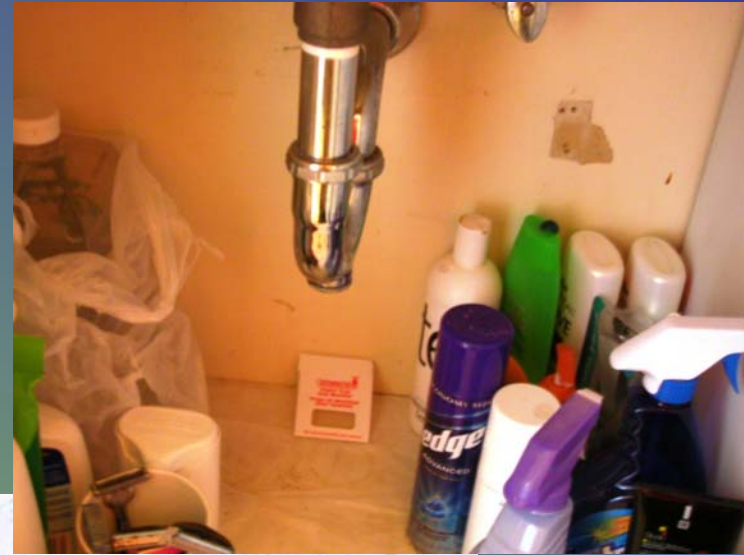
# IPM in UF Housing

## Initial inspection survey results



# IPM in UF Housing

IPM progress



# Part III

*Brachymyrmex:*

**The major ant pest at  
UF Graduate and  
Family Housing**

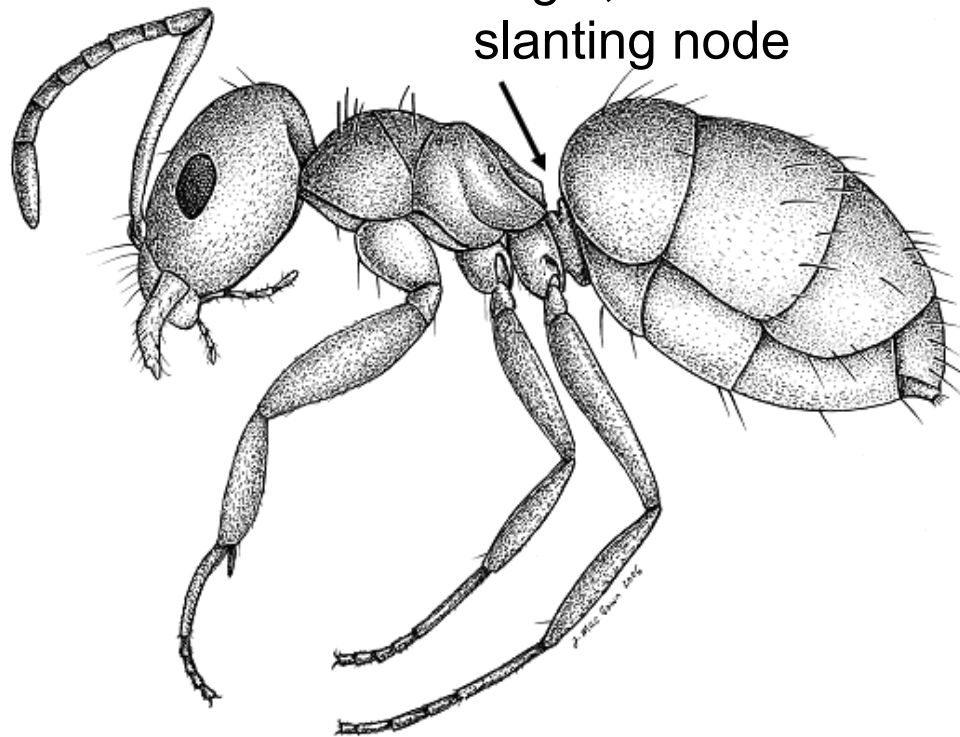
# Ant Pest at UF

## - What are *Brachymyrmex*?

9 segments



Single, forward slanting node



MacGown et al., 2007

# Ant Pest at UF

-What are *Brachymyrmex*?

- ▶ “Rover ants”
- ▶ Small (<2.5mm)
- ▶ Honeydew feeders
- ▶ Nest in soil or rotting wood
- ▶ Do not bite or sting

# Ant Pest at UF

- What are *Brachymyrmex*?

▶ Cryptic, so little is known about them

▶ Suspected most common ant pest in graduate housing

# Ant Pest at UF

- **What I plan to do**

# Ant Pest at UF

- **What I plan to do**

- ▶ **Ecological survey**



# Ant Pest at UF

## - What I plan to do

### ▶ Ecological survey

- ▶ ID the species
- ▶ Describe nesting location & structure
- ▶ Describe foraging behavior
- ▶ Determine temporal pattern of infestation

# Ant Pest at UF

- What I plan to do

▶ Develop an IPM recommendation to manage *Brachymyrmex*

# Ant Pest at UF

## - What I plan to do: data collection

- ▶ Extract service call data from DHRE records to determine yearly infestation trends
- ▶ Observe animals in the field
  - ▶ Nesting location & attributes
  - ▶ Foraging behavior
  - ▶ Daily activity

# Time Line

- Dec 07-Feb 08: Write protocol
- Jan 08: Obtain EH&S pest records
- Feb-Apr 08: Write IPM policy & treatment guidelines
- Mar-Apr 08: Conduct housing survey & initiate IPM program
- Apr 08: M.S. Proposal seminar
- Summer 08: Produce IPM educational material, conduct ant survey & analyze DHRE ant data
- Fall 08: Extract and analyze P.K.Y data
- Mar 09: Conduct housing survey
- Apr 09: Analyze Maguire data
- Spring 09: Thesis, seminar & defense



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