

# **INTEGRATED PEST MANAGEMENT (IPM) IN PRACTICE**



**Siavash Taravati Ph.D.**

What is IPM?

In a nutshell:

**Mix and Match!**

**Don't rely on one method  
only**



# Why IPM?

**Integrated Pest Management (IPM)**  
originally started in response to overuse  
of pesticides.



# IPM methods

- Biological control
- Pesticides
- Physical/Mechanical control
- Environmental/Cultural



# IPM & Pesticides

- IPM is NOT against using pesticides
  - But promotes rational use of it along with other methods
- IPM promotes:
  - Using less toxic
  - Lower dosages
  - Lower number of applications
  - Use insecticides only when necessary

Photo: Jack Clark



# Southern fire ant vs. Red Imported Fire Ant (RIFA)

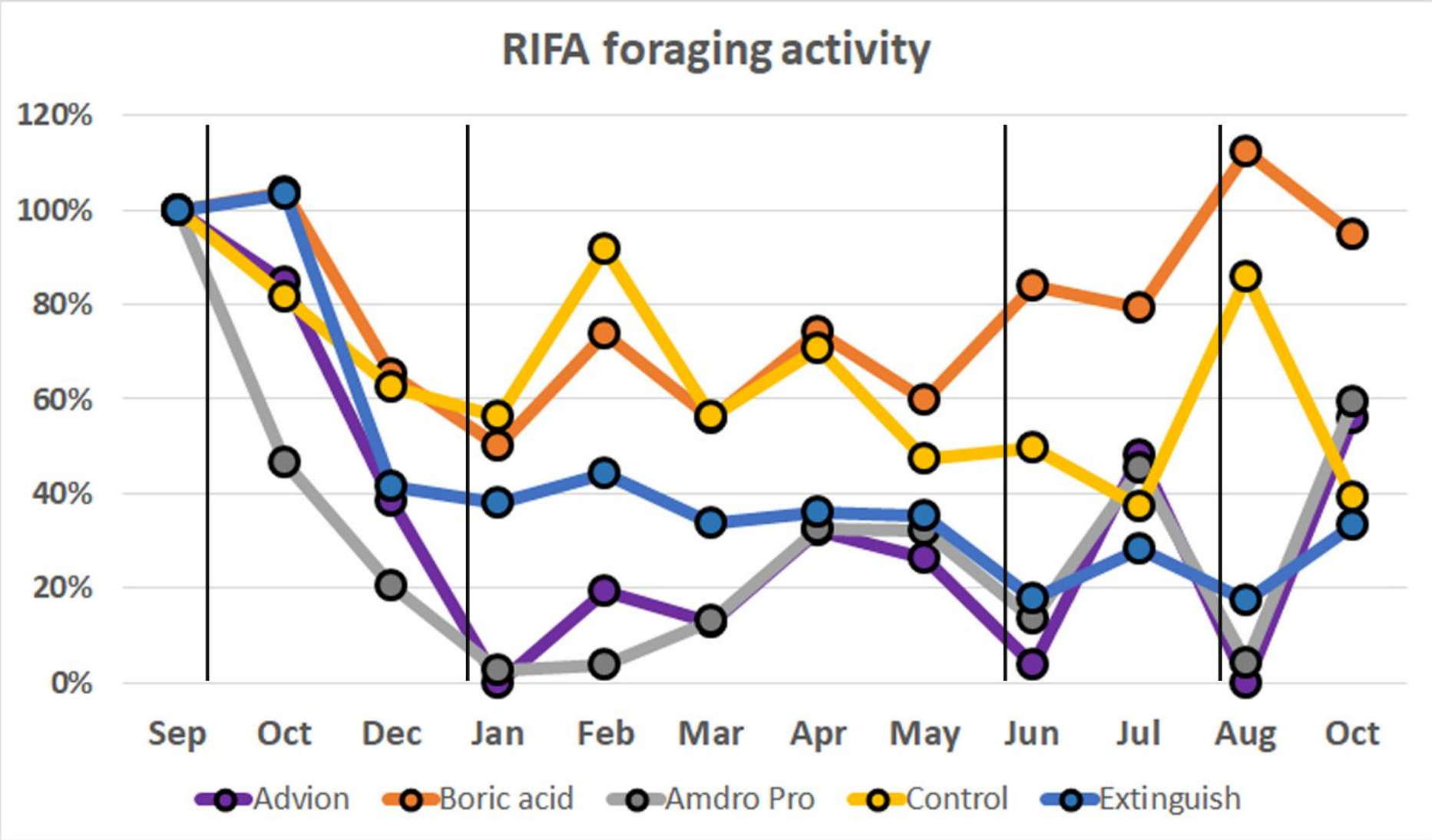
Southern Fire Ant



Red Imported Fire Ant



# IPM is interested in long-term solutions





**NOT RIFA MOUNDS!**



# Advantages of Insecticide

- Usually reliable
  - Exceptions:
    - insecticide resistance
    - wrong formulation
    - Limited coverage
- Fast acting
- Long shelf life
  - Only synthetic insecticides



# Problems with insecticides

- Health hazards
- Insecticide resistance
- Pest resurgence
- Secondary pest problems



# Problems with insecticides

- Resistance: Superbugs!
  - Examples:
    - Bed bug
    - Mosquitoes
    - House fly
    - Cottony cushion scale
    - Colorado potato beetle
    - Silverleaf whitefly
    - Codling moth



Photo: Jack Clark



Photo: Dong-Hwan Choe

# Biological control

*Chouvenc, Mullins,  
and Nan-Yao 2015*

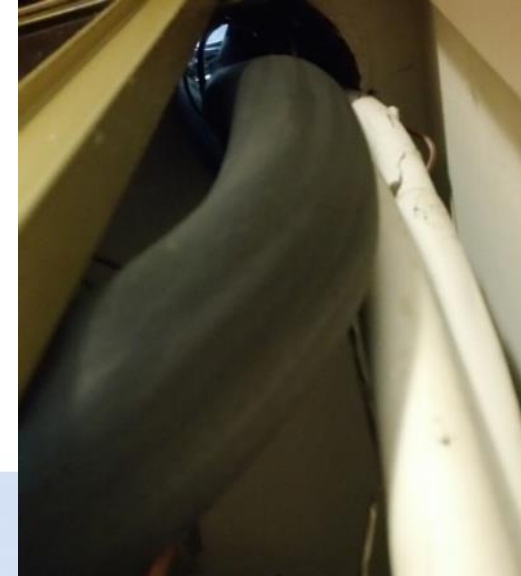
- Definition
- Limitations in structural pest control
  - Low tolerance for biocontrol agents within structures
  - Lack of accessibility
    - e.g. termites in walls, cockroaches in sewer system



CaliforniaHerps.com

# Physical/Mechanical Control

- Screens
- Caulking
- Sealant foam
- Plaster & cement



# Physical/Mechanical Control

- Netting
- Air doors
- Traps



MakeAGIF.com



UC Statewide IPM Project  
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# Pigeon egg trap

Melbourne, Australia

- Pigeons = flying rats



# Environmental/Cultural

- Controlling humidity
  - Dripping
  - Ventilation
- Vegetation
  - Act as a bridge
- Temperature
  - Freezing



city-data.com



buildinspectaustralia.com.au





# Management vs. Eradication

- Management = abatement
- Eradication = complete removal of population
  - Very hard to achieve
- Why management?
  - More realistic
  - Fewer side-effects



IPM



# Deviations from pesticide labeling

- Pesticide label is the law
  - True or False?
- Any exceptions?
  - Yes



# Deviations from pesticide labeling

- **Decrease in dosage rate or per unit treated**
  - Example: 1 lb per acre -> 0.5 lb per acre or less
- **A decrease in the concentration of the mixture applied**
  - Example: 1 fl oz (29.4 ml) per gallon -> 0.5 fl oz per gallon or less
- **Application at a frequency less than specified**
  - Example: four applications per year -> two applications per year

# Deviations from pesticide labeling

- **Use to control a target pest not listed**
  - provided the application is to a commodity/site that is listed and the use of the product against an unnamed pest is not expressly prohibited
  - Example: dark rover ant
- **Employing a method of application not expressly prohibited, provided other directions are followed**
  - Example: broadcasting -> bait station
- **Mixing with another pesticide or with a fertilizer, unless such mixing is expressly prohibited**
- Source: California Department of Pesticide Regulation. Chapter 2: Pesticide Product Labeling Interpretations in Pesticide Use Enforcement Program Standards Compendium-Volume 8. Accessed: Sep 2018

# When can you use IPM?

- When customers let you
- Educate customers
  - UC IPM quick tips



## Quick Tips

UC IPM

## Ants

Although ants are annoying when they come indoors, they can be beneficial by feeding on fleas, termites, and other pests in the garden.



Argentine ants trailing on pavement.

While spraying chemicals inside the house might seem effective, doing so will not prevent more ants from entering. Because most ants live outdoors, focus efforts on keeping ants from entering buildings. Combine several methods such as caulking entryways, cleaning up food sources, and baiting when necessary. Avoid using pyrethroids (e.g., bifenthrin and cypermethrin), especially on hard surfaces such as driveways or sidewalks or around the foundation of buildings. These products pollute waterways.

### Make your house less attractive to ants.

- Caulk cracks and crevices that provide entry into the house.
- Store food attractive to ants in closed containers.
- Clean up grease and spills.
- Ant-proof kitchen garbage pails with sticky barriers such as petroleum jelly under the lip and place pet dishes in a moat of water.
- Remove or manage sweet food sources next to your house such as aphid-infested bushes and ripened fruit on trees.
- Keep plants, grass, and organic mulch at least a foot away from the foundation of buildings to reduce ant foraging and nesting.

### When ants invade your house.

- Sponge up invading ants with soapy water as soon as they enter.
- Plug up ant entryways with caulk.
- Take infested potted plants outdoors and submerge pots in a solution of insecticidal soap and water.
- Clean up food sources by wiping up spills or placing food in tight-fitting containers.
- Rely on outdoor baits to control the ant colony.
- Insecticide sprays shouldn't be necessary.
- If you hire a pest control company, ask them to use baits and spot treatments rather than perimeter treatments or monthly sprays.

### How ant baits work:

Pesticide baits work by attracting worker ants who then take the product back to the nest where the entire colony, including queens, can be killed. The pesticide must be slow acting so workers won't be killed before they get back to the nest.



Ant bait stations.

### How to use baits:

- Place baits near ant trails and nest openings.
- Prepackaged or refillable bait stations or stakes are the safest and easiest to use. Active ingredients in baits may include boric acid/borate, fipronil, avermectin, or hydramethylnon.
- Liquid borate (0.5-1% borate in sugar water solution) baits in refillable bait stations are best for severe Argentine ant infestations.
- Replace baits when empty and reposition them, or try a different bait product if ants don't appear to be taking it.
- It can take 5 to 10 days to see fewer ants.

### What you do in your home and landscape affects our water and health.

- Minimize the use of pesticides that pollute our waterways and harm human health.
- Use nonchemical alternatives or less toxic pesticide products whenever possible.
- Read product labels carefully and follow instructions on proper use, storage, and disposal.

For more information about managing pests, visit [ipm.ucanr.edu](http://ipm.ucanr.edu) or your local University of California Cooperative Extension office.

# Dealing with customers

- Survey (Taravati, unpublished)

| Main Challenge                                                                                           |  | %     |
|----------------------------------------------------------------------------------------------------------|--|-------|
| Regulations                                                                                              |  | 27.6% |
| Controlling pests                                                                                        |  | 13.5% |
| Customers (educating, their expectations, cooperation, online pesticide shopping, customers being cheap) |  | 16.0% |
| Post-treatment customer calls                                                                            |  | 9.8%  |

# Agricultural vs Structural IPM

- Agriculture
  - Action threshold
    - Pest density at which economic loss begins to exceed the costs of control
- Structural pest control
  - Action threshold
    - Usually 1



# How many is too many?

- Residential areas
- Public places
  - Libraries
  - Public buildings





# Economics of IPM

- Is it possible to make similar amount of money when implementing IPM?
  - Sometimes
- Why people buy organic food?
  - More expensive
  - Harder to find
- Importance of communication
- Let the customer know why you are
  - Setting traps
  - Applying gel
  - Seal cracks and crevices



# Mystery bites

- Paper mites
- Cable mites
- Sources:
  - Carpet fibers
  - Paper splinters
  - Particle boards
  - Wire insulations



# Contributing Factors

**Low humidity**

**Static electricity**



# Mystery bite example

- LA County building
- Employees complaining about bites around ankles
- Carpet floor
- Problem started when the office began scanning old paper documents
- The PCO didn't find any bugs



Found nothing



# Potential solutions

- Solutions
  - Apply anti-static spray
  - Anti static mats
  - Carpet cleaning
  - Remove old paper, carpet, etc.



# Delusory Parasitosis



- Scabies: Difficult to diagnose!
- Better not to suggest anything when you don't know

# THANK YOU

Siavash Taravati, Ph.D

Area Integrated Pest Management Advisor

UC Cooperative Extension, Los Angeles County

700 W. Main Street

Alhambra, CA 91801

Phone: 626-586-1981

[staravati@ucanr.edu](mailto:staravati@ucanr.edu)

<http://celosangeles.ucanr.edu>

