The IPM Continuum:
Moving Toward Safer Alternatives

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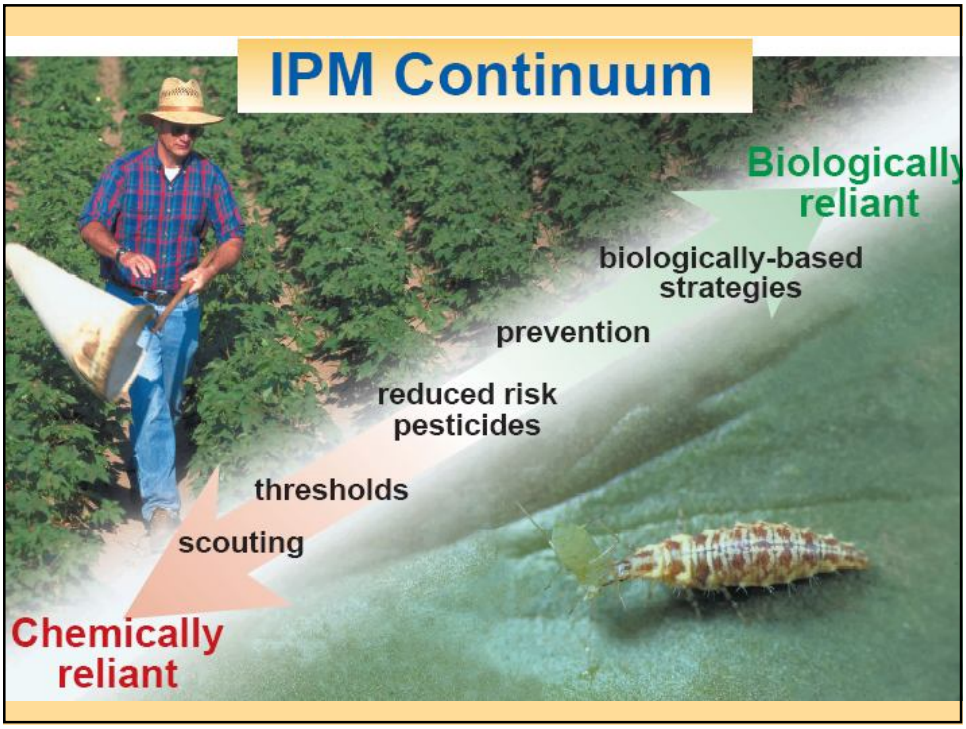
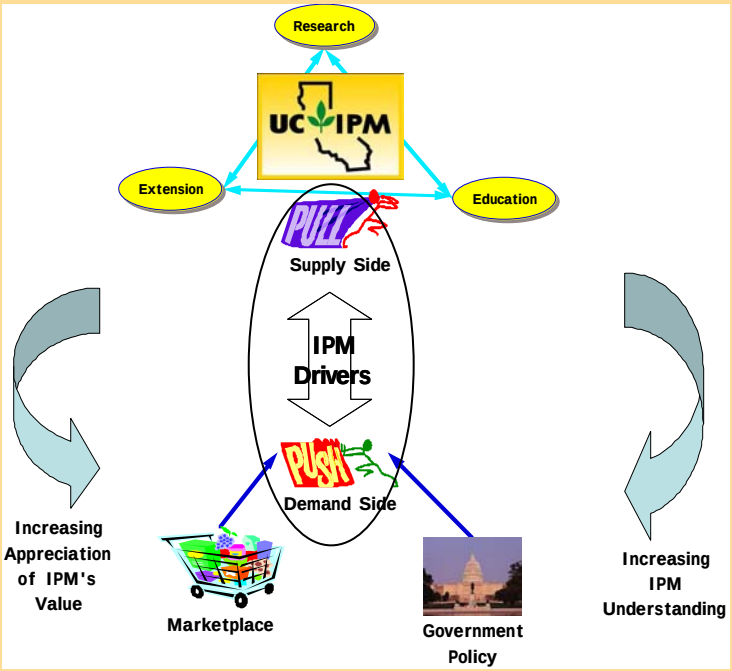
Overview

- What is IPM?
- What drives IPM adoption in agriculture?
- What are the Safer Alternatives and why isn't everyone using them?
- My role is to introduce an appreciation for the complexity of our food system
- Introduce concepts using a broad brush for other speakers to develop later & provide specific examples

Integrated Pest Management Defined

- Ecosystem-based strategy
- Long-term prevention of pests or their damage
- Combination of techniques
  - Biological control,
  - Cultural control,
  - Chemical control
- Pesticides are used only after
  - Monitoring
  - Use of decision thresholds
  - Treatments are made with the goal of removing only the target organism.
- Pest control materials should minimize risks to human health, beneficial and nontarget organisms, and the environment, including soil, air and water.



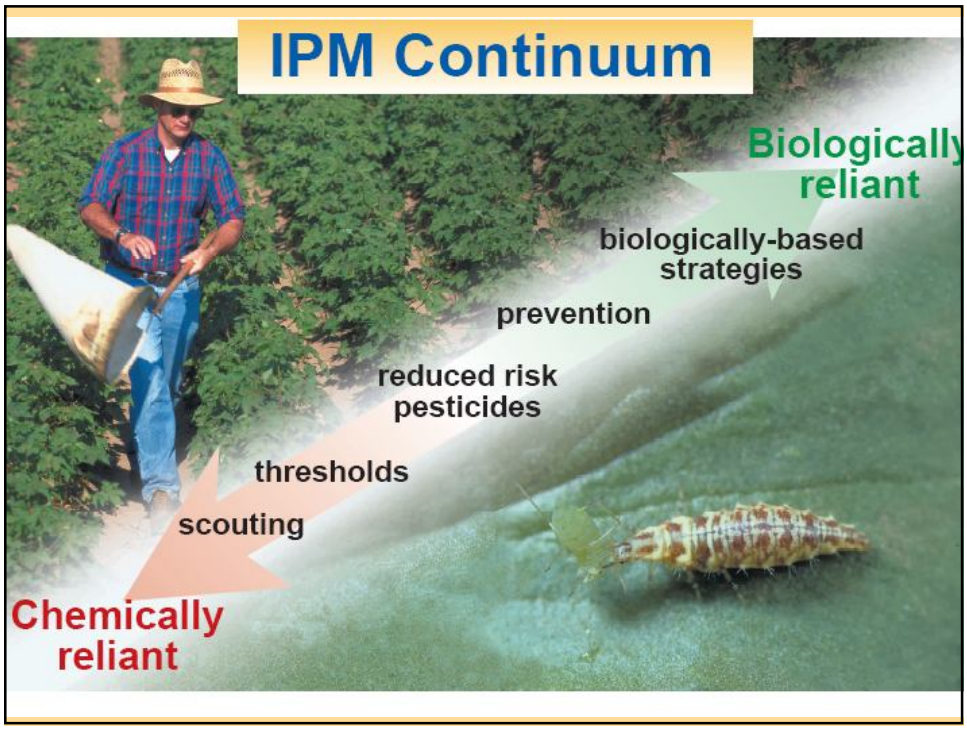


What Are Some Drivers?

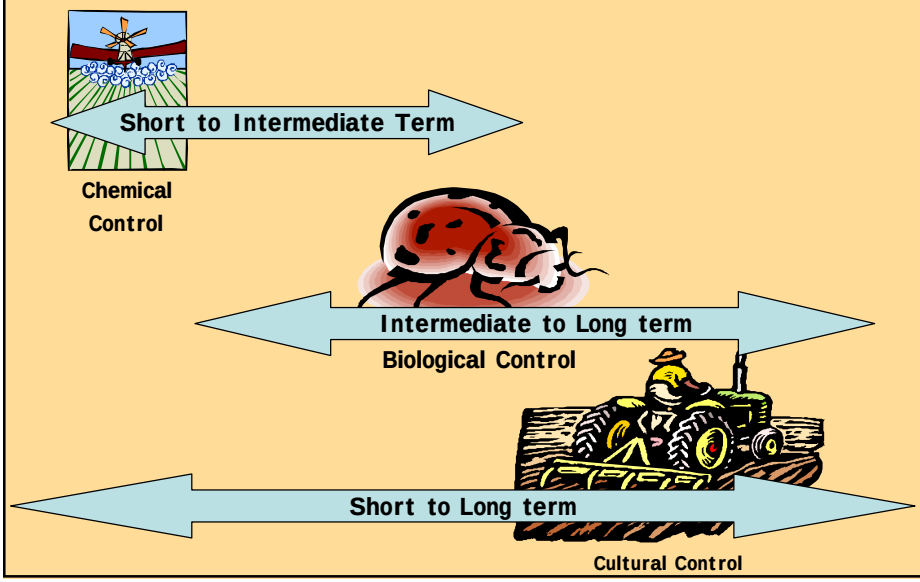
- Balancing Economics & Risk
  - Water quantity and quality
  - Labor availability
- Consumer demand for abundant, affordable, high quality and safe food
- Regulation
  - Human Health
  - Environmental Health
  - Food Safety
  - Export
  - Availability of reduced risk products

What Influence Does the Crop Have?

- Annual or perennial?
- Long season or short season?
- Food or fiber?
- Fresh or processed?
  - Cosmetic appearance important?
  - FDA filth regulations?
- Domestic or export?



Time Scales of IPM Management Approaches



Biological Control

- Conserve natural enemies
  - They provide valuable service for free!
- Augment existing levels
  - Lacewings, predatory mites – expensive
- Why doesn't everyone just let nature take its course?
  - Not reliable enough (risk aversion)
  - Not enough control (economics)
  - Not timely enough (e.g. migrations or invasive species)

Cultural Control

- Resistant crops
  - Traditional breeding vs. bioengineered
- Develop healthy plants
  - Avoid stressing plants
- Planting and/or harvest timing
- Seeding rates - cotton
- Sanitation – reduce sources of infestation

Removing "Mummy" Almonds

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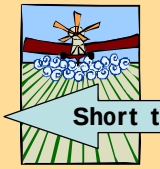


Short to Intermediate Term

Chemical Control

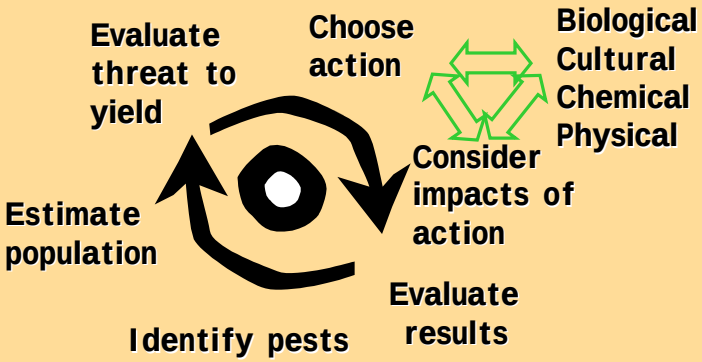
Intermediate to Long term

Biological Control

Short to Long term

Cultural Control

Making Pest Management Decisions



In field, in season

Chemical Control

- Why use chemicals?
  - Protect investment now!
  - Threat too great
  - Risk of loss greater than cost of treatment
- How to decide if treatment needed?
  - Sample frequently
  - Evaluate threat to crop
- Pesticide options
  - Narrow vs. broad spectrum
  - Reduced risk to humans & environment

Pesticide Chemistry: Selective vs. Broad Spectrum

- Targeted is good
  - Gets only the problem pest
  - Preserves natural enemies
  - More “surgical”
- Too selective can lead to:
  - Tank mixes
  - Increased applications over a season
  - Increased costs, more products, more fuel for applications
  - Scheduling conflicts
- Mating disruption

Regulation

- License required to write pesticide recommendation
- Written recommendation required for use products of most pesticides
- Pesticides are highly regulated
  - Label registration process
  - Use according to label

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- Alternatives are available for some pests on some crops
- Farmers are not in the business to manage pests but to produce food, IPM is part of doing business
- Safer to whom?
  - What risks are we discussing, health, economics, rural communities
  - Safety to whom at what risk to others?

Concluding Remarks

- IPM & food production is ecosystem based
- Change one variable it can have unintended consequences in other parts of the system
- The ideal outcome is to have an appreciation of this balance between the need for abundant, affordable, nutritious and safe food while minimizing side effects