

# **Insect Management**

**Erin Hodgson**  
**Extension Entomologist**

**IOWA STATE UNIVERSITY**  
University Extension



# Know your system...

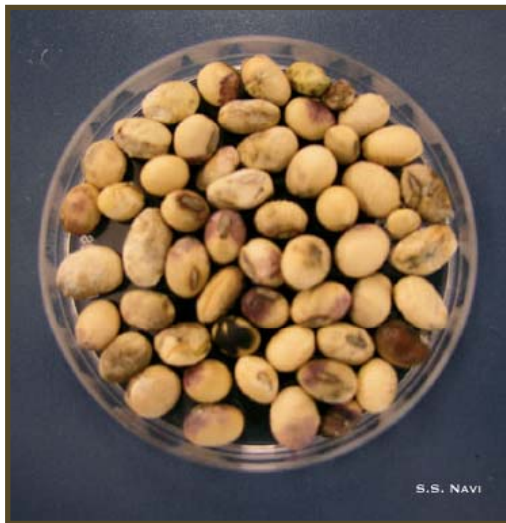
---

- What is the plant, what is normal?
- Most plant health problems are not caused by biotic (living) factors such as insects and disease
- Most plant health problems are a result of non-biological factors (environment, cultural methods, irrigation, plant nutrients, etc.)
- Proper identification of insect is critical

# IPM for insects

---

- Integrated pest management
  - Use multiple tactics to reduce pests
  - Protect yield and minimize loss
  - Only spray when needed
  - Understanding the historical field history



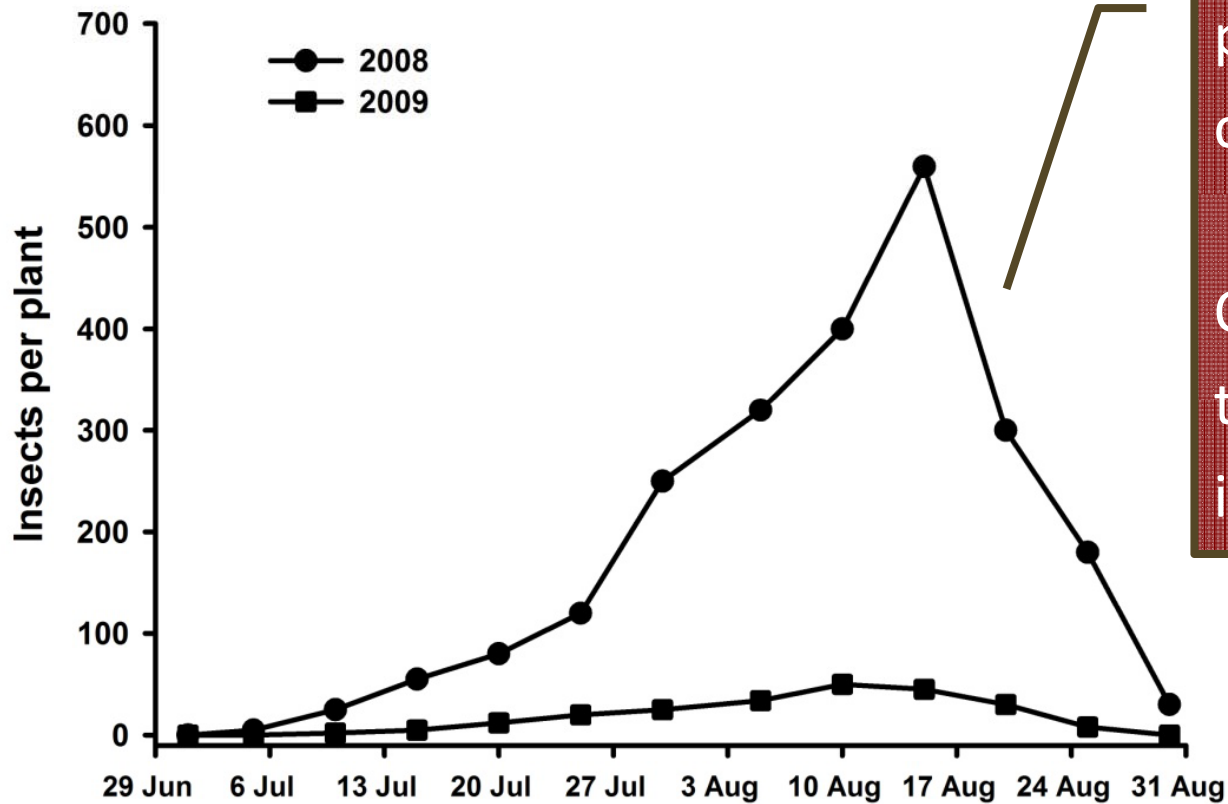
# How to scout for insects

---

- Understand their biology
  - Recognize feeding damage
- Know how to find them
  - Where they feed
  - When they are feeding
- Common tools to estimate density
  - sweep net, in-field counts, sticky traps, etc.



# Typical scenarios



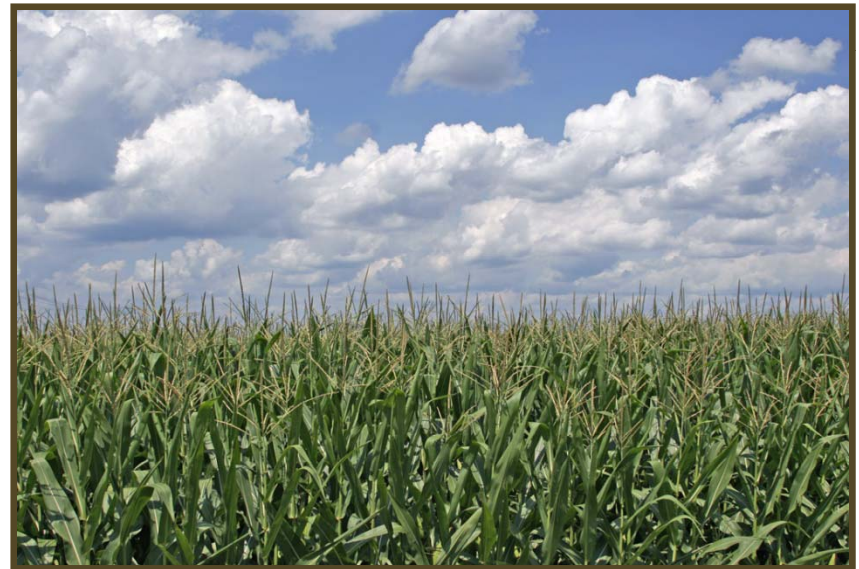
High and low insect populations are common.

Only scouting will tell you what the insects are doing.

# Other IPM tactics for insects

---

- Regulatory
- Genetic
- Mechanical/physical
- Cultural
- Biological
- Chemical



# Genetic control

---

- Select seed that will help minimize yield loss
- Conventional and molecular breeding
- Host plant resistance or tolerance
  - Insects don't survive or do as well



# Mechanical/Physical control

---

- Sanitation
- Tillage
- Harvesting





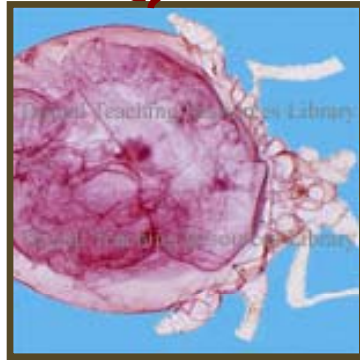
# Biological control

---

- Natural enemies controlling “pests”
- Predators and parasitoids
  - Most pests have enemies
  - Will respond to low/moderate density
- Encourage natural enemies
  - Reduce broad spectrum insecticides



## Parasitoid wasp



## Ladybug



## Lacewing



# Pathogens

---

- Targeted host selection
- Kill, reduce reproduction, or shorten the life
- Environment controls effectiveness
- Relatively slow acting; may take several days



fungal-infected aphid



nematode-infected grub



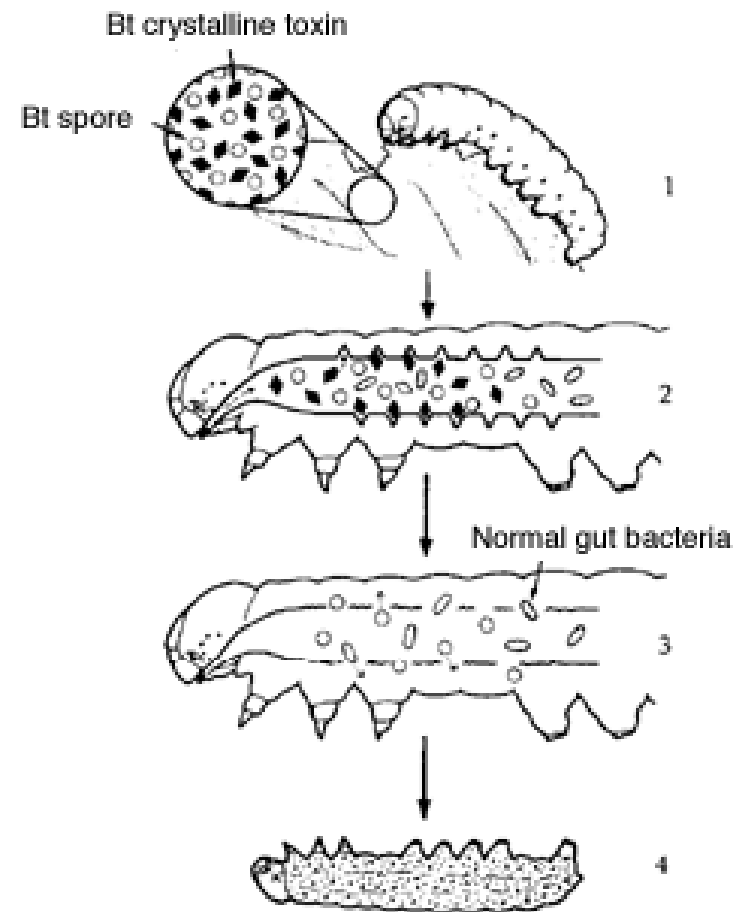
bacteria-infected caterpillar

# Bt as an example...

---

- *Bacillus thuringiensis* “**Bt**”

1. Insect consumes foliage
2. Toxin binds to gut
3. Gut breaks down, allows normal bacteria to enter body cavity
4. Insect dies in 1-2 days



# Chemical control

---

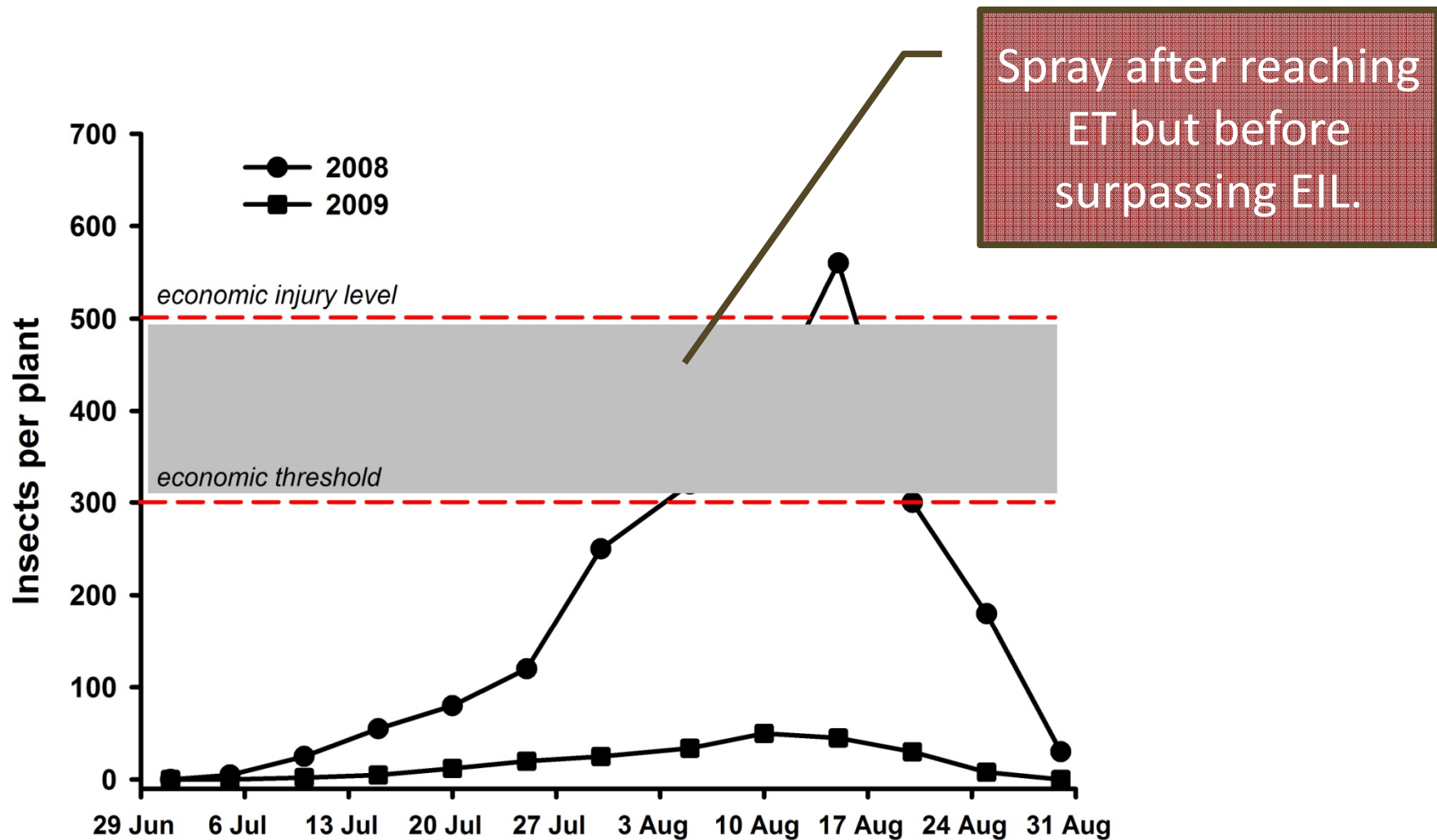
- Traditional insecticides
  - Broad spectrum, long residual, toxic
  - Pyrethroids, organophosphates, carbamates
- Reduced risk “softer” insecticides
- Limit pesticide applications
  - Follow label rates/harvest intervals
  - Think about good timing – when is the best time
  - Alternate chemical classes

# Economic thresholds are key!

---

- Be 'ok' with some insects
  - Avoid calendar-based sprays
- Use a cut-off point to suppress insects
  - # beetles/sweep or # aphids/plant
- Extend insecticide effectiveness
  - Saves money!
  - Prevents genetic resistance
  - Preserves natural enemies
  - Reduces environmental risks

# When should a grower spray?



# Items to consider

---

- Market value of crop
- Overall production costs
- Insecticide costs  
(product plus delivery)
  
- Sufficient coverage
- Maximum suppression
- Leave a check strip!



# Summary

---

- Know the system – plants and insects
- Consider history of insect activity
- Use IPM tactics to minimize insects
- Only spray when needed

IOWA STATE UNIVERSITY  
University Extension

