Managing Stink and Leaffooted Bugs in Almonds

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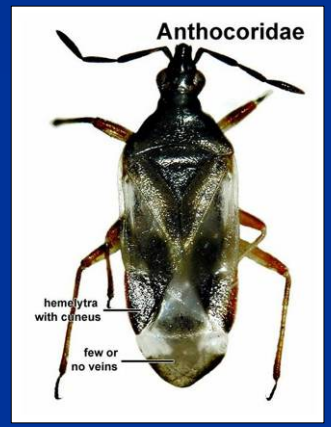
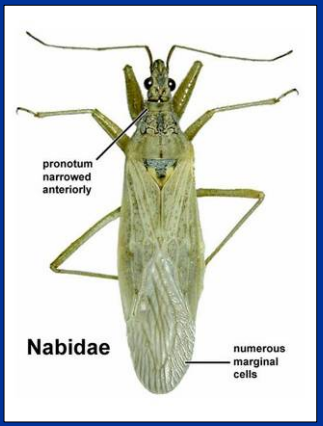
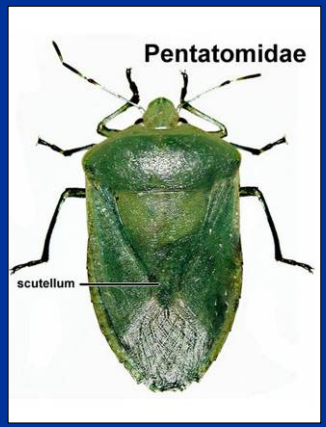
No longer just secondary pests

- Leaffooted bug
  - 2006- Major outbreaks
    - Primarily due to weather
    - Two straight mild, wet winters 04-05 and 05-06
    - 89,430 Acres of almonds sprayed with Lorsban (14,456 in 05)
    - Hard frost 06-07, problem went away
  - 2008-10 significant issue in isolated locations
- Stink bug (Green soldier bug)
  - Becoming more prevalent
  - Especially in blocks with ~3 years on soft program

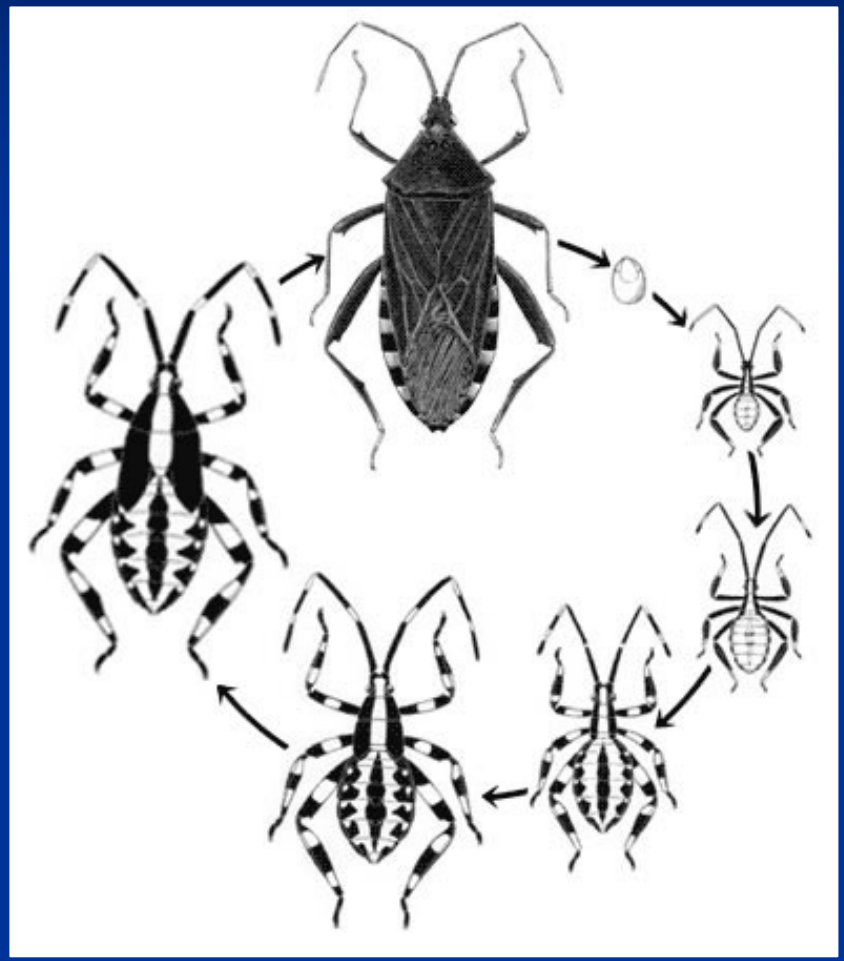
Taxonomy: Class Insecta, Order Hemiptera, Family Coreidae (=leaf-footed bugs)





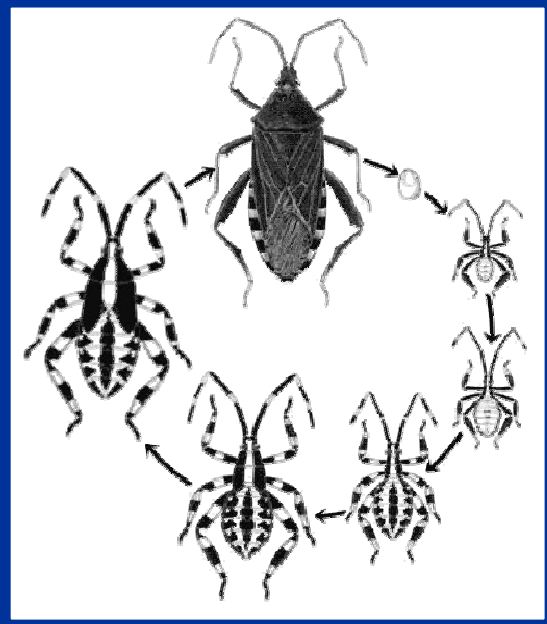


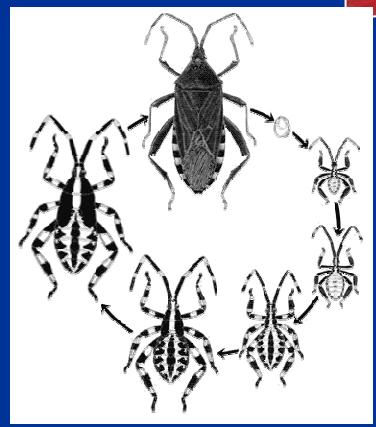
Developmental Stages



Typical bug life cycle

- Egg
- Multiple immature stages (instars) separated by a molt
  - Look similar to adult
  - May be different colors
- No pupa
- Adult





Stink bug life stages

Feeding Mechanism

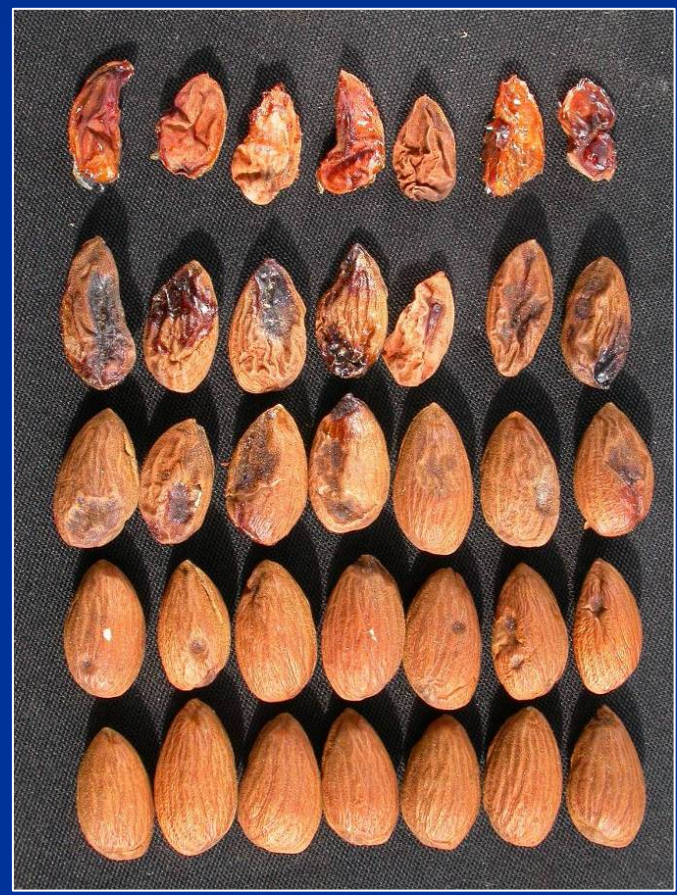
- Bugs have piercing-sucking mouthparts (straw)
- Proboscis extends about ½ the length of the insect
- Primarily seed feeders
  - Pistachios, almonds, juniper berries, pomegranates, others
- Penetration of proboscis facilitated by enzymes
  - Can penetrate pistachio shell late in the season

Overwintering

- Leaffooted bugs
  - Adults
  - Aggregations
  - Sheltered areas
  - Outside orchard
- Stink bugs
  - Adults
  - Diapause
  - Do not aggregate
  - Inside orchard
  - Especially cover crops

In-Season

- Leaffooted bugs
  - Migrate to orchards March through May
  - Adults cause damage
    - Abortion early (to early May)
    - Deformation/staining later
  - Usually leave or die
- Stink bugs
  - Damage almonds May through July
  - Adults cause damage
    - No abortion
    - Deformation/staining



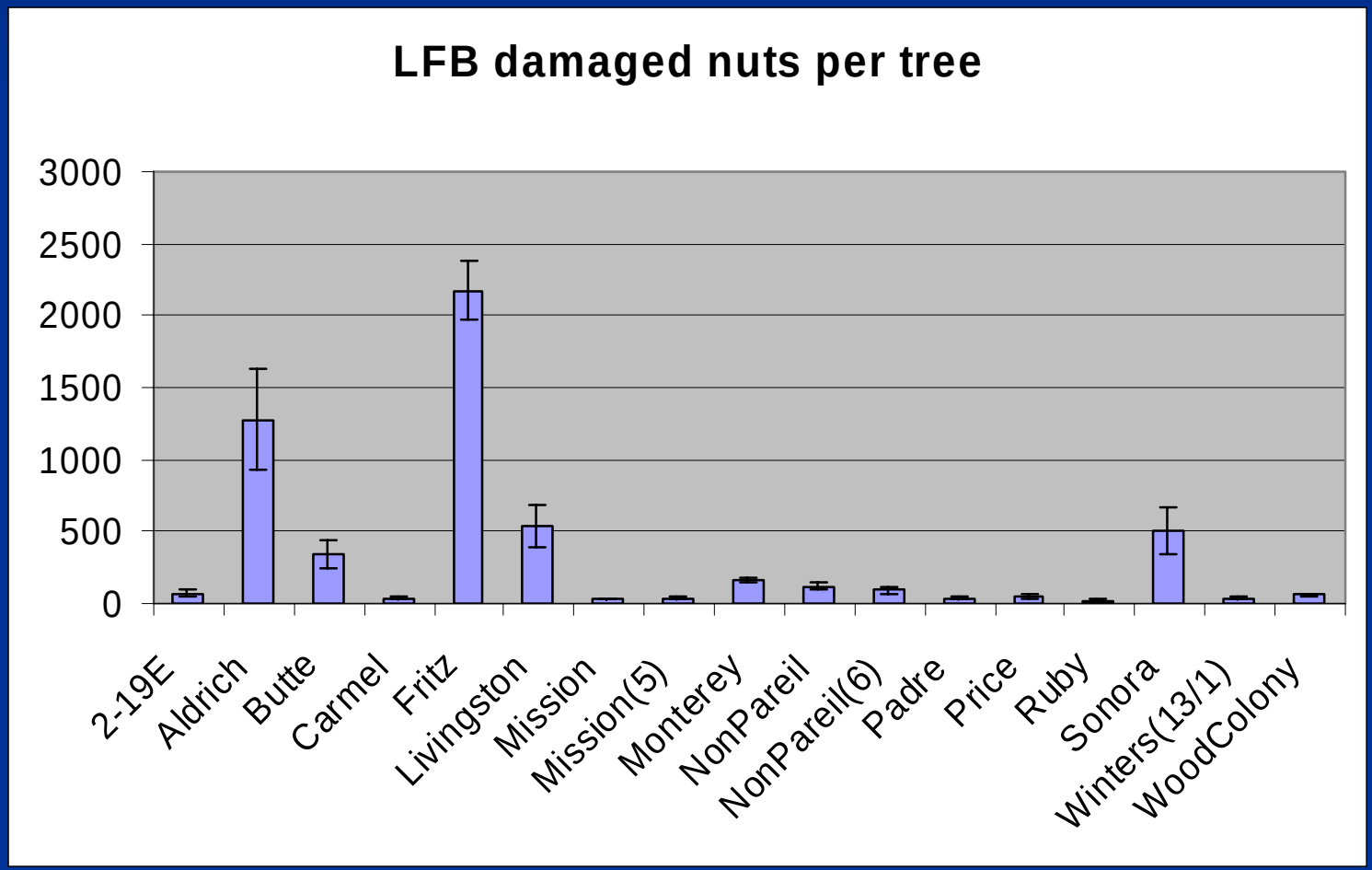
Eremothycium coryli

LFB in Fall

- Found in crops like pomegranates until crop is gone
- Migrate to overwintering sites
- Overwinter as adults

Varietal preferences

- Significant for leaffooted bug



Monitoring Program

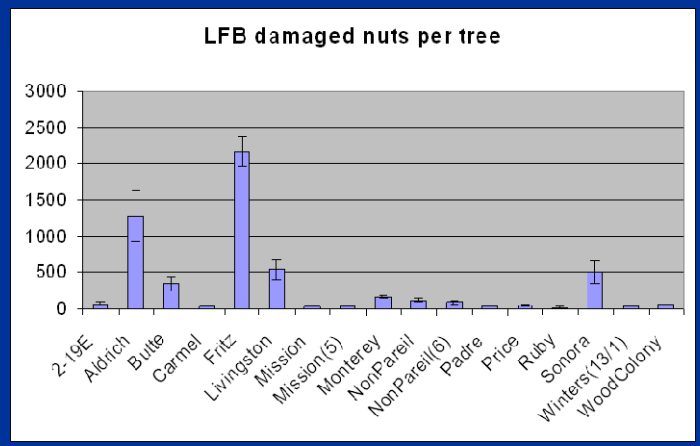
- Monitoring for the insects
  - Leaffooted bug
    - Adults cryptic
    - Often high in the tree
    - One bug can do lots of damage
  - Stink bug
    - Less mobile, eggs and nymphs
- Monitoring for gummosis
  - Look for gummosis
  - Cut a cross-section to see if probing was involved
- Look for nut drop
  - Especially susceptible varieties
  - About a 7 day lag period

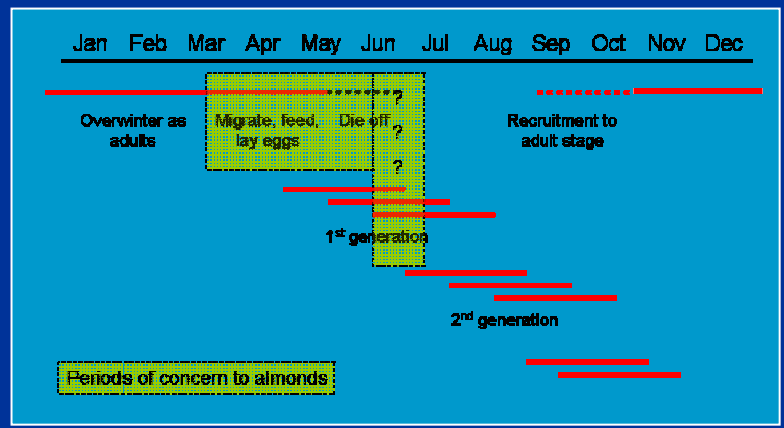
Control Program

- If you see the bugs…

  or gummosis…

  or bug-induced nut drop
  - Consider the variety
  - Consider the time of year
  - When in doubt, treat
- Talk to your friends





Control Program

- Insecticides
  - Lorsban
  - Pyrethroids
    - Brigade, others
  - Agri-Mek (LFB only)
- Double up as NOW, PTB, or Mite spray when possible
- Consider tanking in a miticide if using a pyrethroid

Biological Control

- *Gyron pennsylvanicum*
- Egg parasitoid
- Effective in most years
  - But only during the summer
  - No eggs occur from fall through May

Looking towards next year…

- Leaffooted bug
  - Populations similar to last fall
  - Expect damage similar to last season
    - Generally not an issue
    - Significant in a few locations
- Stink bug
  - Next year starts where last year ended
  - Keep track of time on soft program
  - Cover crops, proximity to pistachios