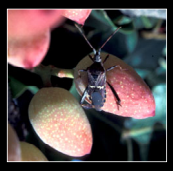
Leaffooted Bug Biology and Management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Outline for Today

Origins and Distribution
- Arrival in California
- Current pest status

Basic Biology and Seasonal Ecology
- Life stages
- Seasonal phenology

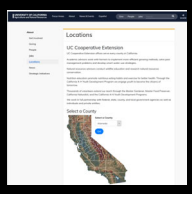
Modern Management
- Monitoring
- Biological control
- Insecticide sprays

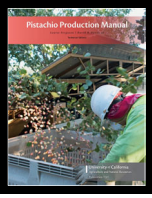
Key Additional Resources

Local Farm/IPM Advisor
- https://ucanr.edu/About/Locations/

UC Statewide IPM Program Website
- https://www2.ipm.ucanr.edu/agriculture/pistachio/Leaffooted-Bugs/

Pistachio Production Manual (2016)
- UC ANR Publication #3545
- https://anrcatalog.ucanr.edu/Details.aspx?itemNo=3545





Leaffooted Plant Bug
Origins, Arrival in CA, Current Pest Status

Leaffooted Bugs (LFB)
Origins + Arrival in CA

Species Name
Order: Hemiptera
Family: Coreidae
Species 1: *Leptoglossus zonatus*
Species 2: *Leptoglossus clypealis*
Species 3: *Leptoglossus occidentalis*

Arrival in California
Leptoglossus found throughout the Americas
1900s – Reported *L. zonatus* in Baja, Cen. America, So. America
1940s – Reported *L. zonatus* on citrus and pomegranate in AZ
1980s – Reported *L. clypealis* on pistachio in CA

Leaffooted Bugs (LFB)
Key Species in California

Leptoglossus zonatus
- Two distinct yellow marks on pronotum
- Most common species currently

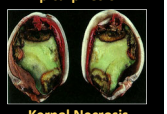
Leptoglossus clypealis
- Distinct clypeus points outward from head
- Used to be abundant, now less common

Leptoglossus occidentalis
- No marks, no clypeus
- Rare, mostly a forest/conifer pest

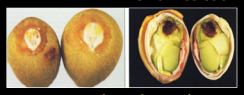
Leaffooted Bugs (LFB)
Current Pest Status

- Pierce-suck feeder, primarily seeds
  - But attack a wide range of hosts
- Directly attack pistachio nuts
  - Early season (Apr – Jun)
    - Epicarp lesion
    - Nut drop/abortion
  - Late season (Jun-Sept)
    - Kernal necrosis
    - "Achilles heel"
- Transmit Pathogens
  - Stigmatomycosis
  - Botryosphaeria
  - Shoot blight

Epicarp Lesion



Kernal Necrosis



Damage through stem base

Leaffooted Plant Bugs
Basic Biology and Seasonal Ecology

Basic Biological Parameters
Life Stages

Eggs → Nymphs → Adults

Strands of barrel-shaped eggs on twigs, nuts, leaves

Five immature stages

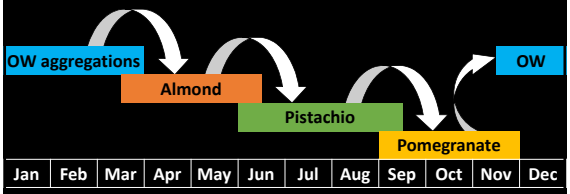
Adult legs with distinct leaf shape

Aggregation Behavior
Overwintering and In-Season

Aggregation Behavior
Overwintering and In-Season

- Overwinter as adults in sheltered areas
- Overwintering sites can include…
  - Woodpiles
  - Barns
  - Residential areas
  - Eucalyptus
  - Citrus
  - Palm
  - Cypress
  - Juniper
  - Riparian areas

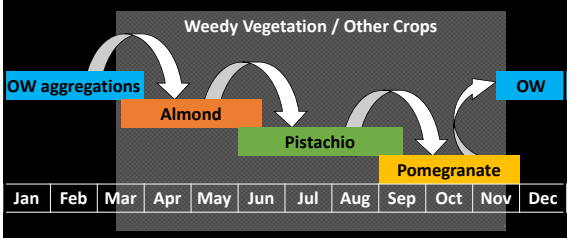
Seasonal Ecology
Movement Between Orchards
Adults Become Active March - May



Seasonal Ecology

Movement Between Orchards

Potential Role of Alternate Hosts



Seasonal Ecology

Movement Between Orchards

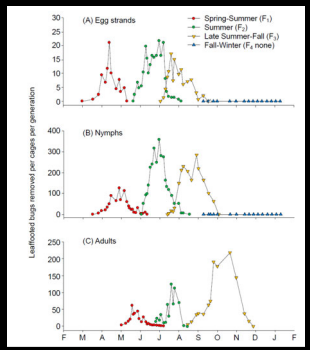
Gut Content Analysis Shows Alternate Hosts

Gut Contents	Orchard Type		
	Pistachio	Almond	Pomegranate
Pomegranate	0.2	1.0	68.2
Pistachio	34.8	16.4	0.8
Cucurbita spp.	32.6	1.1	2.7
Almond	2.2	27.6	0.0
Helianthus spp.	3.8	10.7	1.2
Peppers	0.0	12.6	0.0
Pinus spp.	0.0	7.2	0.0
Sowthistle	7.0	0.1	0.0
Corn	1.0	2.1	0.7
Alfalfa	0.2	2.8	0.0
Kiwi	0.3	0.4	0.4
Juniper	0.7	0.2	0.1
Strawberry	0.1	0.0	0.1
Cucumber	<0.1	<0.1	<0.1
Potato	<0.1	<0.1	<0.1
Tomato	<0.1	<0.1	<0.1
Other	0.1	<0.1	<0.1

Data: D. Evans (CSU Fresno)

Seasonal Ecology

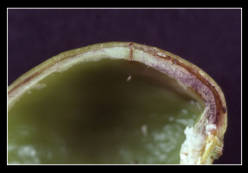
3-4 Generations/Year



Leaffooted Plant Bugs
Integrated Pest Management

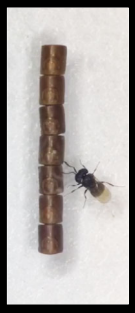
LFB Management in Pistachio
Integrated Pest Management

Key Tools
1. Biological Control
2. Monitoring
3. Insecticides

Biological Control
Natural Enemies

Parasitoids
- *Gryon pennsylvanicum*
  - Most active later in the season
  - Doesn't control the spring adults

Photos: R. Straser, UCR

Monitoring

Beat Sampling, Visual Searching

Start monitoring clusters in April

Monitoring Techniques

- Beat sampling
  - Early in the morning, bugs less active
  - Hold tray below, strike clusters
  - Examine what falls out
  - Nymphs? Consider treating
- Look for egg masses
- Look for damage (small, black nuts)

Chemical Controls

Pyrethroids

- Bifenthrin (Brigade)
- Cyfluthrin (Baythroid)
- Lambda-cyhalothrin (Warrior)
- Permethrin (Pounce, Ambush)

Make the Most of Your Spray

- Calibrate sprayer, check weather conditions, go slow

Keep in Mind

- Orchard proximity to potential overwintering sites
- Dry-down or tillage of adjacent weedy fields
- Populations are fast/sporadic → be on the lookout

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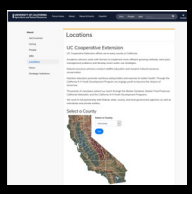

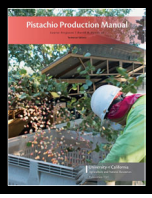

Thank you!!

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