Leaffooted Bug in Almonds: A Retrospective Review of the 2006 Season

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Introduction

Leaffooted bug is an established pest of California's Central Valley that periodically reaches sufficient population levels to cause economic damage to almonds. During 2006, growers reported damage throughout most of the lower San Joaquin Valley, with sporadic damage occurring in the northern San Joaquin and Sacramento Valleys. The most common damage reported was nut abortion during the month of May, with some of the more susceptible varieties in hard-hit areas having an excess of 50% crop loss. Additional economic losses occurred due to decisions growers made to protect further crop losses by spraying tens of thousands of acres with chlorpyrifos. In response to the damage during 2006, this project focused on documenting what occurred during this season in hopes to help growers and pest control advisors be more prepared should it happen again

Documenting the types of damage that occurred during 2006

Damage from leaffooted bug was documented during the 2006 season. Yield losses were documented early in the season due to the abortion of entire nuts; quality losses were documented later in the season as leaffooted bug damage caused kernels to be off-graded as inedibles.

Early Season Damage (Primarily April and May)

- Leaffooted bug penetrates into the kernel while feeding
- Gummosis on the hull surface indicates damage has occurred
- Kernels shrivel
- Tree aborts nut
- Damaged kernels are sometimes picked up at harvest, but disintegrate during hulling
- Aborted nuts are a yield loss, though some compensation can occur in the size of remaining nuts

Mid-season Damage (Primarily June and maybe July)

- Leaffooted bug penetrates into the kernel while feeding
- Kernel becomes damaged
- Nut remains in the tree
- Damaged kernel is off-graded as an inedible at harvest
- Damaged kernels equal a direct quality loss for the entire load
- This type of damage is not extremely common for reasons that are not fully understood

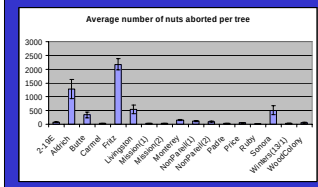
Life cycle of leaffooted bug

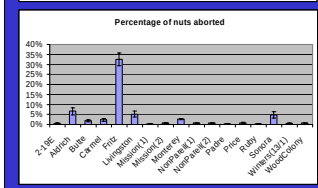
Nymphs and adults can both be identified by the leaf-like projection on the hind leg.

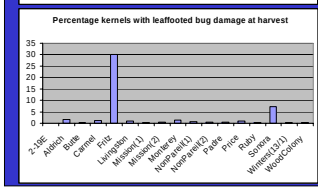
- Leaffooted bug overwinters as adults that hide in or outside orchards during the winter.
- In the spring, adults migrate into crops like almonds and feed on seeds (nuts).
- Adults lay beadlike eggs in strands of about 8-14. One adult can lay in excess of 200 eggs over a 2-month period.
- Eggs hatch into nymphs that undergo several molts before becoming adults.
- Additional life cycle data (i.e., number of generations per year, how long they remain in almonds, etc., still needs to be developed.

Documenting losses in yield and quality

Leaffooted bug damage was documented during 2006 at the Kern County Regional Almond Variety Trial. Nuts aborted by June (excluding those aborted due to lack of pollination) were collected for 15 of the most common varieties in the trial, and were counted and compared to the average numbers of nuts at harvest. Subsamples of 500 kernels were evaluated for each variety at harvest to evaluate quality loss.







There were huge varietal differences in the number of aborted nuts among varieties. Though it was not possible to distinguish nuts aborted by leaffooted bug from those aborted for other reasons, data suggests that Fritz, Aldrich, Livingston, Sonora and Butte are highly susceptible to leaffooted bug damage, and that other varieties such and Nonpareil and Mission are not as susceptible. This correlates very closely with reports coming from the field.

Another important observation from the field is that less sensitive varieties can still be damaged, especially in fields were no highly sensitive varieties are present. In other words, if leaffooted bug are present they will feed on the best host variety, even if that variety may not be the overall best host.

At harvest, Fritz and Sonora had significant numbers of kernels damaged by leaffooted bug. Other varieties had relatively low amounts of this late-season damage despite the fact that the field was never sprayed with insecticides for leaffooted bug.

Thresholds?

Based on the charts to the left, harvest data, and a price of $2.50/lb, very rough estimates are that crop losses for this field were…

>$2,000/ac
Fritz
>$600/ac
Aldrich, Sonora
>$100/ac
Monterey
Non-Pareil
$40-60/ac
Wood Colony, Price, Padre
<$40/ac
6 varieties

Interpretation- Even in a really bad leaffooted bug year, not all fields or all varieties need to be treated.

Recommendations for next year:

Look for leaffooted bugs (an excellent indicator but very difficult to do), gummosis on nuts in the tree (not hard but takes effort, and indicates damage has already occurred), and aborted nuts (very easy but indicates that 2 weeks of damage have already occurred) in April and May. Cross section damaged nuts to ensure leaffooted bug is the cause.

If any of these indicators are present, consider the time of year, level of damage, and varieties present in the field before making a treatment. Chlorpyrifos treatments are effective, though other options are available.

Funding: These data and analysis were supported in part by a grant from the Almond Board of California