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Almond Leaf Scorch

BETH L. TEVIOTDALE, University of California Cooperative Extension Plant Pathologist, Kearney Agricultural Center, Parlier; and **JOSEPH H. CONNELL**, University of California Cooperative Extension Pomology Advisor, Butte County

The bacterial disease known as almond leaf scorch presents a potentially serious threat to California almond orchards. The disease may be spread in the orchard by sharpshooter leafhoppers or spittlebugs, which feed in the xylem where water is conducted through the tree. Within a few years, affected trees become unproductive and may die. Early identification and elimination of diseased trees may minimize the problem and effectively reduce further tree losses. This publication highlights disease symptoms and provides management suggestions.

SYMPTOMS

Almond leaf scorch symptoms first appear on individual leaves in early June to mid July. The tips or margins of leaves initially turn light gray-green (fig. 1). The scorching occurs with the onset of hot weather.

By late July, symptoms are fully developed and are most noticeable (fig. 2). It is important to identify and mark affected trees then, while the scorched areas of the tree canopy contrast clearly with healthy green leaves. Once harvest begins, mites, dust, and drought stress combined with tree shaking often make signs of almond leaf scorch difficult to detect.

The disease develops slowly over several years, infecting more of the tree with each succeeding year (fig. 3). It may be easily overlooked when only a few leaves on one branch are affected. Almond leaf scorch is also known as Golden Death because of the striking yellow color of a fully infected tree's canopy. These trees eventually die (fig. 4).



Figure 1. Affected leaves develop a tan marginal scorch with a characteristic yellow band between the scorched and green portions of the leaf.

Figure 2. Patches of dead tissue may occur on leaf margins, and leaves often curl as they die. Entire leaf blades may be affected.



VARIETY SUSCEPTIBILITY

Almond leaf scorch is most common and severe in the Peerless variety, followed by Sonora. Nonpareil is also susceptible and can be significantly affected. The disease is rare in Carmel and Butte and is seldom seen in other varieties.



Figure 3. Once a large branch or two is infected the disease is more easily noticed. Such infections may have already been present for more than two years.

PATHOGEN AND VECTORS

Almond leaf scorch and Pierce's disease of grapevines are caused by the same bacterium, *Xylella fastidiosa*. Insects carry the pathogen from plant to plant, but tree to tree spread of the pathogen has not been proven. The green sharpshooter, *Draeculacephala minerva*, and the red-headed sharpshooter, *Carneiocephala fulgida*, are the most common vectors of the pathogen found in almond orchards. The glassy-winged sharpshooter, *Homalodisca coagulata*, may become even more successful at spreading the pathogen in almond orchards because, unlike other known vectors, it prefers to feed on trees. The small, green potato leafhopper (*Empoasca* sp.), prune leafhopper (*Edwardsiana prunicola*), and the white apple leaf hopper (*Typhlocyba pomaria*) that commonly feed on almond leaves are not vectors of this disease.

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WHAT TO DO

No chemical or nutritional treatments control almond leaf scorch. In addition, no research or practical experience suggests that disease occurrence is reduced by controlling the vectors with insecticides. If you suspect that a tree may be infected, *first test its leaf tissue for excess salts, particularly chloride and sodium.*

Salt injury, particularly chloride burn, may be mistaken for almond leaf scorch. Sometimes the two are indistinguishable (fig. 5).

Salt injury may occur at any time but often worsens as the growing season progresses (fig. 6). Ordinarily it is a result of excess salinity in soil or water. Unlike almond leaf scorch, salt injury affects numerous trees in one concentrated area rather than individual trees widely scattered throughout an orchard.

If sodium and chloride levels are normal, and salinity has been eliminated as a possible cause of the problem, contact your farm advisor to have the tree tested for almond leaf scorch. The best time to test for almond leaf scorch is July through September. The best management practice known now is to remove infected trees. The value of pruning out very early infections is under investigation.



Figure 4. By the time symptoms engulf the entire canopy the tree may have been infected with leaf scorch bacteria for 3 to 5 years.



Figure 5. Salt burn is generally more concentrated at leaf tips than along margins, and it usually lacks the yellow band between the brown and green areas of the leaf that is characteristic of almond leaf scorch.



Figure 6. Late season almond leaf scorch symptoms.

FOR MORE INFORMATION

You'll find more information on plant diseases at these Web sites and in these and other publications, slide sets, CD-ROMs, and videos from UC ANR:

<http://www.ipm.ucdavis.edu/PMG/selectnewpest.almonds.html>

<http://www.cnr.Berkeley.edu/xylella>

Integrated Pest Management for Almonds, ANR Publication 3308
(order from <http://anrcatalog.ucdavis.edu>)

Pierce's Disease, ANR Publication 21600
(order from <http://anrcatalog.ucdavis.edu>)

<http://ucce.ucdavis.edu/special/gwss/pubs.html>

Pierce's Disease, Glassy-Winged Sharpshooter online media kit
(view at <http://news.ucanr.org>)

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