Guidelines for Alternaria Leaf Spot Management

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Alternaria Leaf Spot

Alternaria leaf spot is a fungal disease of almond leaves. The disease develops in late spring and early summer and may cause pre-mature defoliation of trees. The disease is caused by species of *Alternaria* in the *Alternaria alternata* complex – *A. alternata, A. tenuissima,* and *A. arborescens.*

Location

Alternaria leaf spot is most common in the low areas of the San Joaquin Valley (Rosedale, Shafter, Wasco, McFarland, Pond and Delano) but is found throughout almond growing regions of the state, especially in locations with high humidity (e.g., along rivers, low spots where dew accumulates, and in orchards where soils require frequent irrigation schedules).

Variety Selection

Most Susceptible Varieties:Carmel, Mission, Sonora, Price, Yokut, Kahl, Johlyn, Winters, Wood Colony, Chips and Morley.

Less Susceptible Varieties: Fritz, Savana, Plateau, Sano, Jenette, Butte, Ruby, 2-19E, Livingston, Monterey and Savana.

Most Tolerant: Padre, Aldrich, Rosetta, Nonpareil and Kapareil.

Planting Arrangements – to allow air circulation

Good-Deep Soils: On the square (22 x 22 ft) and on the rectangle (24 x 22 ft).

Good-Shallow Soils: On the rectangle (24 x 18 ft or 22 x 18 ft).

Row Direction: It should be North-South.

Tree Training – to reduce dew formation

Tree Shape: Trees should be trained to an upright position. This can be accomplished by cutting a topping 6 to 12 inches from the treetops. To maintain the tree limbs upright, the topping should be done after the first growing season, then, repeated for the next three growing seasons. In addition to the topping, the trees should be tied each year. Depending on the crop load, trees may need double or triple ties. In general, pruning will allow more light penetration and reduce shading out (forced senescence from lack of pruning) of the inside canopy.

Foliar Disease Control – to decrease the amount of diseased (stressed) leaf tissue

Shot Hole: Effective fungicides are Pristine®, Rovral®, Captan®, and Ziram®.

Scab: Effective fungicides are Pristine®, Abound®, Flint®, Topsin-M®, and Ziram®.

Rust: Effective fungicides are Pristine®, Abound®, Flint®, Maneb®, and wettable sulfur.

Mite Control – to decrease the amount of injured leaf tissue

Water Stress: Mite Control depends on tree water stress management. The "pressure bomb" allows us to monitor the tree's water status.

Dust control – Dust prevention will reduce mites in soil and spores of *Alternaria* species on decaying organic materials to be transported in dust to leaves in the tree canopy.

Chemical Control: Agri-Mek® has been effective in most orchards. New miticides are being registered at this time.

Irrigation Management – to reduce relative humidity in the orchard

Water Penetration: This may be overcome by the use of gypsum and cover crops (barley).

Prolong Wet Soil Surface: Adjust irrigation frequencies to allow the surface soil to dry between waterings.

Chemical Control

Fungicides: Strobilurins (e.g., Abound-28 day PHI, Flint-60 day PHI) are most effective when applied in late April to late June. Pathogen populations have a high potential to develop resistance to fungicides in this chemical class (i.e., strobilurins) when the fungicides are over used. New chemistries such as Pristine (pre-mix of two active ingredients –pyraclostrobin and boscalid) and difenconazole that can be used in rotation programs will be available in the future for this spring period. Pristine is currently registered for up to five weeks after petal fall (early April). Other fungicides such as Rovral and Bravo used in the petal fall period have only suppressive activity and need to be used in conjunction with other fungicides in the late April to late June period.

Timing: Two to three applications between mid-April and late-June depending on favorable environmental conditions (early treatments are most important). A model is being developed that will predict infection periods of the pathogen and thus, optimum spray application dates for managing the disease. Research done to date indicates that infection periods predicted by the model coincide with the effectiveness of early treatments starting in late April and early May.

Orchard Floor Management

Clean Cultivation: Clean cultivation reduces the moisture content in the air or relative humidity in the orchard that is generated from transpiring plants (cover crops, weeds, etc.) and thus, reduces the amount of dew in fluctuating day/night temperatures. Reduced vegetation also reduces the amount of senescing plant tissue being colonized by *Alternaria* species and, in turn, reduces the amount of spores of *Alternaria* sp. in the air that may function as inoculum for stressed almond leaves.

Chemical Mowing: A method of clean cultivation that reduces the potential for dust from cultivation and mowing equipment.