



Pest Alert

Septoria Leaf Spot and Alternaria Late Blight on Pistachio

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Pistachio infected with Septoria leaf spot and Alternaria late blight

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Septoria leaf spot and Alternaria late blight, fungal diseases on pistachio, were confirmed in September 2008 on trees grown in Otero County. A survey of pistachio orchards revealed that trees in Hidalgo, Luna, Sierra and Dona Ana Counties were also infected. In many orchards, trees were infected with both diseases. These are common diseases in other states where pistachios are grown, but have not been previously reported in New Mexico.



Figure 1 Early symptoms of Septoria leaf spot

Septoria Leaf Spot Symptoms: The first symptom of the disease is the development of round to irregular, brown, necrotic spots, 1-2 mm in diameter, which form in between small veins on both sides of the leaf (Figure 1). These spots may increase slightly in size with time, but generally remain small and isolated from one another. Hundreds of spots may develop on each infected leaf. Over time, large sections of the leaf turn tan in color (Figure 2). In severe cases, trees defoliate prematurely which reduces the amount of carbohydrates produced and stored by the tree, ultimately decreasing vigor (Figure 3).



Figure 2 Advanced symptoms of Septoria leaf spot

Alternaria Late Blight Symptoms: The first symptom of the disease is the development of dark brown to black, round or angular lesions, 3-7 mm in diameter. Lesions can develop anywhere on the leaf. As the lesions age, they enlarge and merge together to form larger areas of blighted tissue (Figure 4). Late in the season, the blighted areas turn black. Severe leaf blighting results in premature defoliation and decreased vigor (Figure 5). *Alternaria* also infects the fruit resulting in reduced yield and quality. On immature fruit, small, black spots approximately 1 mm in diameter develop in association with lenticels. On mature hulls, lesions are black, 1-5 mm in diameter, and may be surrounded by a reddish purple margin. In severe cases, the entire hull turns black. Infections are more severe in early-spilt fruit and cracked fruit (Figure 6).



Figure 3 Premature defoliation often associated with Septoria leaf spot

Conditions for Disease: *Septoria pistaciarum*, the causal agent of Septoria leaf spot in New Mexico, only infects pistachio, and overwinters in fallen leaves that were infected with the disease the previous growing season. In the late

winter and early spring fruiting bodies develop in fallen leaves. Spores produced in these fruiting bodies are released during periods of rain. Rain and wind driven spores that land on susceptible leaf tissue can germinate and penetrate these leaves resulting in new infections.

Three species of *Alternaria* have been reported to cause disease in pistachio. These fungi are very common and are capable of infecting many different plant species, including many weeds. They are also capable of colonizing crop debris. Thus, other crop plants and weeds, fallen pistachio leaves and other plant debris all serve as overwintering sources for *Alternaria*. The fungus sporulates on the surface of infected plant tissue producing copious amounts of infective spores. These spores are easily spread to susceptible plant tissue by wind and rain.

These diseases are favored by high moisture. Higher than average rainfall in the summer of 2008 provided excellent conditions for disease development. New Mexico's typically arid climate may help to limit serious outbreaks of the disease on a yearly basis.

Management: Management of Septoria leaf spot and *Alternaria* late blight begins with good sanitation practices such as raking and destroying fallen leaves, pruning dead and dying branches, and removing weeds in and around the orchard. These practices help to reduce the amount of inoculum present the following year. In pistachio orchards where *Septoria* and/or *Alternaria* are present, preventative fungicide applications may be necessary for disease management. Applications should be made when conditions are favorable for disease development. In New Mexico, applications in July and August are likely to be most effective in managing these diseases.

In New Mexico, fungicides¹ with the following active ingredients are registered for the management of Septoria leaf spot in pistachio: azoxystrobin (Abound®), trifloxystrobin (Gem®), copper hydroxide (Nu Cop®, Kocide®), potassium bicarbonate (Armcarb®), and chlorothalonil (Bravo®). In addition to these fungicides, pyraclostrobin (Cabrio®), pyraclostrobin + boscalid (Pristine®), and cyprodinil + fludioxonil (Switch®) are registered to control *Alternaria* leaf blight in pistachio.

¹The products mentioned in this publication are provided only as a guide. The authors and New Mexico State University assume no liability resulting from their use. Mention of specific products does not imply an endorsement or guarantee of those products, nor does it imply criticism of other, similar products. Please be aware that pesticide labels and registration can change at any time; by law, it is the applicator's responsibility to use pesticides ONLY according to the directions on the current label. Use pesticides selectively and carefully and follow recommended procedures for the safe storage and disposal of surplus pesticides and containers.

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Figure 4 *Alternaria* late blight foliar symptoms



Figure 5 Severe case of *Alternaria* leaf blight leading to premature defoliation



Figure 6 *Alternaria* late blight fruit infection (early middle and late)