

Alternaria Blotch

Alternaria mali

I. Introduction: Alternaria blotch has been a serious problem in North Carolina since the late 1980s. By 1993, growers in nine counties in southern and central Virginia reported seeing this problem, some with as much as 50 to 60 percent defoliation on 'Delicious'. The disease was first observed in West Virginia in 2008. Although leaf blotch severity may vary from year to year, there are strong indications that it has spread to new areas in North Carolina, Virginia, and West Virginia, and could become a problem in more northern areas of the mid-Atlantic region. Disease severity is aggravated by severe mite infestation. Maintaining good mite management is an important factor in preventing severe disease development.

II. Symptoms: Lesions first appear on leaves in late spring or early summer as small, round, purplish or blackish spots, gradually enlarging to 1/16 to 3/16 inch (1.5-5 mm) in diameter, with a brownish purple border (photo 2-41). Lesions may coalesce or undergo secondary enlargement and become irregular and much darker, acquiring a "frog-eye" appearance. When lesions occur on petioles, the leaves turn yellow and 50 percent or more defoliation may occur. Severe defoliation leads to premature fruit drop. Alternaria leaf blotch is most likely to occur on 'Delicious' strains and should not be confused with frog-eye leaf spot, captan spot, or with 'Golden Delicious' necrotic leaf blotch. Frog-eye leaf spot usually appears earlier in the season and is associated with nearby dead wood or fruit mummies.

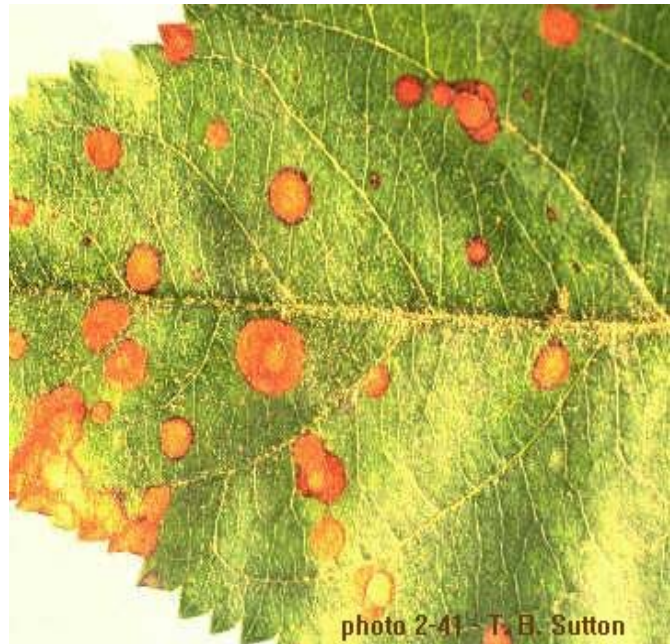
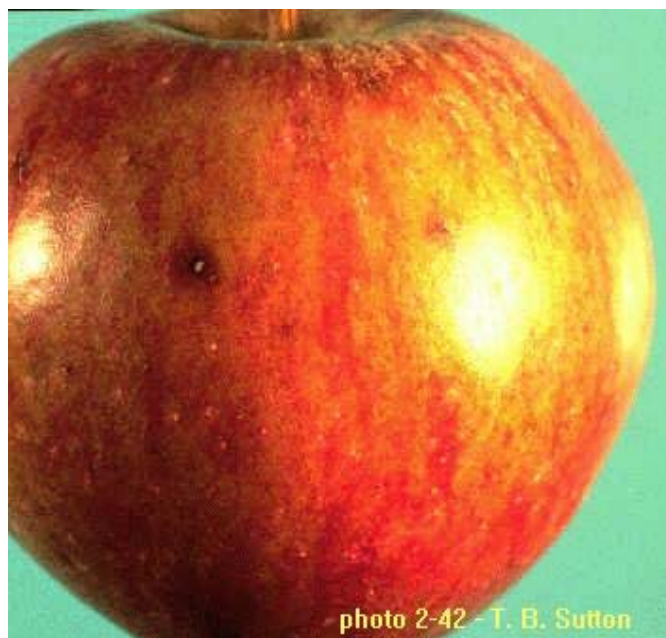


photo 2-41 - T. B. Sutton

Captan spot spray injury occurs when captan fungicide is applied under wet conditions; it is usually worse near the sprayer, and regularly appears on leaves of the same age on the terminal shoots. 'Golden Delicious' necrotic leaf blotch commonly occurs in July and August as a result of physiological stress caused by fluctuating soil moisture.

Alternaria mali also causes a rather inconspicuous fruit symptom (photo 2-42), similar to cork spot (calcium deficiency). Typically, the incidence of fruit infection is relatively low, but in heavily defoliated orchards, fruit infection as high as 60 percent has been reported.



III. Disease Cycle: The fungus can overwinter as mycelium on dead leaves on the orchard floor, in mechanical injuries in twigs, or in dormant buds. Primary infection takes place about one month after petal fall. The disease advances rapidly in the optimum temperature range of 77 to 86 F (25-30 C) and wet weather. At optimum temperatures, infection occurs with 5.5 hours of wetting, and lesions can appear in the orchard two days after infection, causing a serious outbreak. The fungus produces a chemical toxin which increases the severity of the disease on susceptible cultivars.

IV. Monitoring: Mite populations should be monitored closely and maintained at less than six to eight per leaf in orchards where Alternaria blotch has been a problem because mite stress increases disease severity. Refer to European red mite in Insect and Mite section for monitoring procedures. 'Delicious' is the most susceptible cultivar (photo 2-42). Monitor for leaf symptoms (photo 2-41) and defoliation starting one month after petal fall. Determine percent leaves infected in areas of the orchard where mite injury is most intense. Continue to monitor mites to maintain populations at less than six to eight per leaf where this disease is a problem. Currently registered fungicides do not provide satisfactory control under severe disease pressure. If a more effective fungicide was available and registered, the action threshold for its use would be when approximately 50 percent of the leaves show evidence of developing lesions.

V. Management: Some strobilurin fungicides are registered for management of Alternaria blotch in the U.S. Chopping leaves with a mower or removing them from the orchard will help reduce the inoculum level for the following season. Since defoliation from the disease is more severe if high mite populations are present, mites should be maintained at or below the established IPM thresholds.

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11/05/1998

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