

## Blister Spot

### *Pseudomonas syringae* pv. *papulans*

**I. Introduction:** This bacterial disease is of economic importance mainly on the cultivar Mutsu (Crispin) but can be seen on Golden Delicious when grown adjacent to Mutsu. Even though fruit grow to maturity and no detectable yield loss occurs, severe infection results in ugly fruit and greatly reduces fresh market quality.

**II. Symptoms:** Infections of blister spot are first noticeable two to three months after petal fall as small, green, water-soaked, raised blisters that develop at fruit stomata (photo 2-39). These spots result in purplish black lesions associated with fruit lenticels. As the fruit increase in size, the lesions expand to about 3/16 inch (5 mm) and become darkened. A mid-vein necrosis of Mutsu apple leaves has been observed prior to fruit lesion development (photo 2-40).

**III. Disease Cycle:** The bacterium overwinters in a high percentage of apple buds, leaf scars, and diseased fruit on the orchard floor. Throughout the growing season, the bacterium can survive as an epiphyte on foliage and fruit in the orchard. Even though the highest populations of the pathogen have been found on Mutsu, the bacterium has also been detected on



foliage and fruit of other apple cultivars. Young Mutsu fruit show an increased susceptibility to infection for about six weeks, beginning about two weeks after petal fall.

**IV. Monitoring:** Earliest spots (photo 2-39) can be detected near the calyx end of the fruit that face the sun and are on the periphery of the tree, beginning about mid- to late June in southern fruit-growing areas and mid- to late July in northern areas.

**V. Management:** The disease is mainly a problem on the apple cultivar Mutsu. When Mutsu is interplanted with other (normally) resistant apple cultivars (i.e. Red Delicious, Cortland, and others), the pathogen may spread into these, also. Prior to the development of streptomycin-resistant strains of the pathogen, the disease could be controlled with three well-timed antibiotic sprays, the first applied no later than 2 weeks after petal fall, and the others applied weekly thereafter. This strategy is still employed in orchards without resistant strains; however, resistant strains may develop after only a few years of antibiotic use. Once resistance to the antibiotic develops, further use of antibiotic is ineffective.

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