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SEPTORIA LEAF SPOT OF TOMATO

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Tomato, Lycopersicon esculentum Mill., is among the most popular and most commonly grown vegetable in Florida. The value of this crop exceeds that of any other vegetable in Florida (5).

Septoria leaf spot caused by the fungus Septoria lycopersici Speg. occurs world-wide on tomato and can be one of the most destructive diseases of tomatoes. Septoria leaf spot was first reported and described in Argentina in 1882 by Spegazzini (6). It was reported in the United States in 1895 by Halsted of New Jersey (8). The disease has been most destructive in the tomato-growing areas of the northcentral and mid-Atlantic states east of the Mississippi River (3,5,6,11). Septoria leaf spot was reported in Florida in 1911 (6) and again in 1926, where it caused moderate damage to a field of staked tomatoes on the Florida west coast (11). Plant pathologists and plant breeders who work with tomatoes have not reported this disease since 1950 (R. E. Stall and J. P. Jones, personal communication). In February 1980, a tomato specimen was submitted by an Agricultural Products Specialist to the Bureau of Plant Pathology, Division of Plant Industry. The specimen had typical Septoria leaf spot and stem symptoms and was diagnosed as Septoria lycopersici. This specimen was collected from a small dooryard garden near Naples, Florida.

SYMPTOMS. The disease may occur at any stage of plant development. Symptoms are generally first observed on the lower leaves of the host after the plant has begun to set fruit. Small water-soaked spots 1.6 to 3.2 mm in diameter (1/16 to 1/8 in) appear on leaves, stems, calyxes, blossoms, and less frequently on fruit (Fig. 1). The leaf lesions rapidly grow larger and circular in shape and show a definite dark margin up to 6.4 mm (1/4 in) in diameter. Pycnidia (fruiting bodies) may be seen in the tan center of the leaf spot either with the eye or with aid of a hand lens (2,5,6). Lesions on the stems are generally dark elongated spots which bear pycnidia. While the fungus seldom attacks fruit, and then only as small dark spots (6), it does cause defoliation which results in sunscalding of the fruit (3).

DISSEMINATION. Spores are spread by splashing rain and wind-blown water, by hands and clothing of pickers (second picking most likely), by insects (chiefly beetles), and by cultivation equipment (8,10). Seed has been shown to carry spores, but there is some doubt that the fungus is truly seedborne (10).

Fig. 1. Septoria lycopersici on Lycopersicon esculentum: A) small water-soaked leaf spots and larger tan centered leaf spots; B) elongated stem lesions.

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ETIOLOGY. Numerous spores (conidia) are produced in dark flask-shaped fruiting bodies (pycnidia) and are exuded from the mature pycnidia in a mucilaginous matrix. The temperature range for sporulation varies from 15 to 27 C (59 to 80.5 F) with 25 C (77 F) being optimal (9).

Following dissemination, germination of spores may occur within 48 hours under moist conditions and favorable temperatures (optimal 25 C) (7). Infection of tomato leaves is primarily through the stomata. Symptoms of infection are evident within 5 days, pycnidia appear within 7-10 days, and spore production is repeated within 10-13 days.

Variability in pathogenicity by isolates of this fungus has been demonstrated by the different sizes of leaf spots produced on selected tomato varieties (4).

HOST RANGE. Septoria lycopersici attacks tomato and potato (Solanum tuberosum L.) and their wild relatives such as jimsonweed (Datura stramonium L.), horsenettle (Solanum sp.), and ground cherry (Physalis sp.) (3,6). Varying degrees of resistance exist in commercial varieties and wild relatives of tomato (2,6).

CONTROL. Removal of weed hosts in the environs and deep plowing of crop refuse will reduce fungus inoculum. In certain situations, soil fumigation may be advisable to destroy infected plant material in the soil.

The planting of certified seed or certified plants is suggested as a further precautionary measure. Since varieties of tomato in Florida have not been tested for resistance to Septoria leaf spot, a recommendation cannot be made for resistant varieties.

The fungicides maneb, zineb, captan, Dithane M-45, Daconil, and Benlate have been reported to control this fungus (1,3). Fortunately, one or more of these fungicides is currently used for disease control in Florida. Thus, they serve as an added benefit in controlling any Septoria leaf spot.

Based upon the temperature range of 15 to 27 C (59 to 80.5 F) for sporulation, the threat of a severe outbreak of Septoria leaf spot is not normally present in Florida except early in the spring when temperatures range from 15.5 to 26.5 C (60 to 80 F) with high humidity and rainfall conducive to disease development.

SURVEY AND DETECTION. Septoria leaf spot most often coincides with the onset of fruit production but can occur at any stage of plant development including the seedling stage. Most damage occurs to leaves and stems causing defoliation followed by fruit scalding. Leaf spots usually occur on bottom leaves first as small water-soaked spots 1.6 to 3.2 mm (1/16 to 1/8 in) on leaves, stems, calyxes, and blossoms. Leaf spots enlarge up to 6.4 mm (1/4 in) having a dark border with a tan center with tiny fruiting bodies (pycnidia) which are visible to the eye and more distinct with the aid of a hand lens. The disease is most prevalent when the humidity is high, and the temperature is between 15 and 27 C (59 and 80.5 F).

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