

LEAF SCORCH OF STRAWBERRY

T. S. Schubert

Strawberries (*Fragaria X ananassa* Duchesne) are one of the most popular fruits grown in Florida home gardens (7). The crop also provides a multi-million dollar income for commercial producers in Florida. Though the strawberry plant is a perennial, it is most often grown as an annual in our state. A small plot of 25 plants given proper care can be expected to yield 20 to 30 quarts of fruit. In addition to the delicious fruit, the ornamental qualities of the strawberry plant have found a place in landscapes as ground covers and pot plants.

The strawberry has gained this popularity despite the large number of major and minor diseases which affect the plant. A foliar pathogen, *Diplocarpon earliana* (Ell. & Ev.) Wolf [imperfect state: *Marssonina fragariae* (Sacc.) Kleb.] causes leaf scorch, a cosmopolitan disease which damages *Fragaria* spp. wherever they grow. The pathogen often occurs in conjunction with other foliar pathogens, especially leaf spot caused by *Mycosphaerella fragariae* (Tul.) Lind. (6). This habit of coexisting with other foliar pathogens on the host makes it difficult to assess damage by the leaf scorch pathogen alone, but estimates are around 5-10% loss annually on susceptible varieties (6).

Leaf scorch disease was first reported from France in 1832 (4), and by 1883, the pathogen was found in Illinois (2) and a year later in New York (5). Within 10 years of its discovery in America, the economic impact of the disease was being felt in the northeastern United States, and ever since, leaf scorch has been regarded as one of the more important diseases of strawberry.

SYMPTOMS. Symptoms of leaf scorch first appear as numerous purple, somewhat irregular-margined leaf spots, 1 to 5 mm in diameter (Fig- 1A). With age, the centers of the lesions turn a medium brown, differing from the lesions caused by the leaf spot pathogen, *Mycosphaerella fragariae*, which causes a purple spot with a light gray center. Lesions of the leaf scorch pathogen often coalesce to occupy most of the leaflet or leaf, causing extensive reddish purple patches. Usually at this time, asexual fruiting structures (acervuli) of the pathogen become obvious as shiny black dots concentrated on the upper side of the leaves (Fig. 1B). These fruiting structures are large enough to see with the unaided eye. As the enlarging lesions dry out, the leaves curl up from

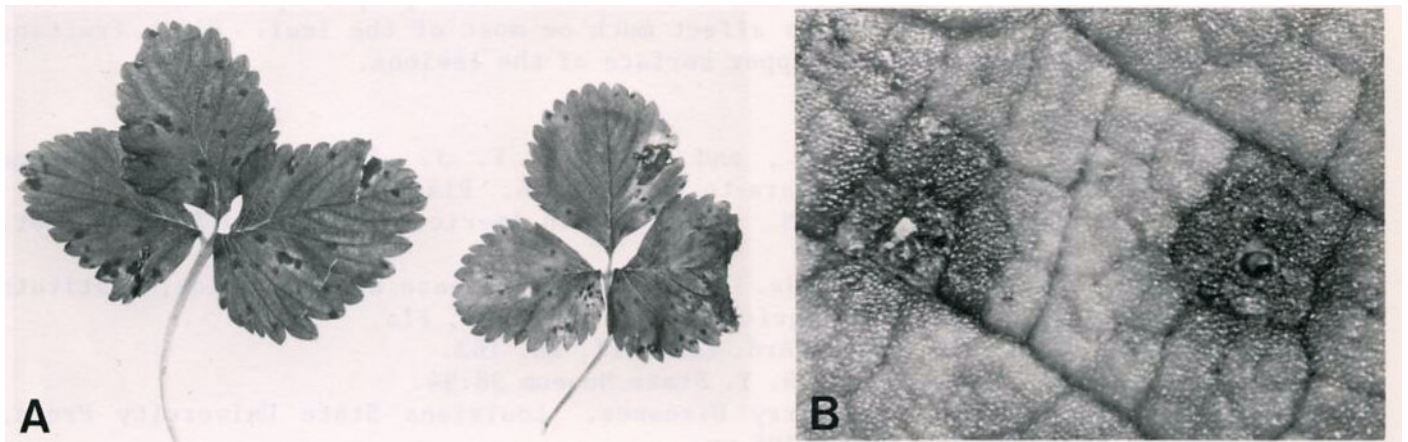


Fig. 1. Leaf scorch of strawberry. A) Leaf on left shows early symptoms consisting of irregularly shaped purple spots. Old lesions begin to coalesce as shown on leaf at right. B) Acervuli appear as black shiny pustules in necrotic tissue. (DPI Photos #702484-9 and #705529)

the margins inward and take on a scorched, tan appearance, hence the common name of the disease. Lesions can also occur on petioles, and on fruit peduncles, pedicels and calyces. The pathogen produces sexual fruiting structures (apothecia) on the lower side of the leaves during the winter months. Where the crop is grown as an annual, the water-splashed conidia produced in acervuli represent the only source of inoculum, though newly acquired sets retaining diseased foliage could bear the sexual stage of the pathogen. The fungus is very slow growing and difficult to isolate on artificial media; therefore symptoms and signs of the pathogen on the host plant are used almost exclusively for diagnosis.

CONTROL: Strawberry varieties with resistance to leaf scorch are available. Of the varieties usually grown in Florida (Florida 90, Sequoia, Tioga, Florida Belle, Tufts, Pajaro, Douglas, and Dover), only Tufts is known to have resistance to leaf scorch, while Tioga and Sequoia are rated intermediate and susceptible, respectively (1). The other varieties named above have not been specifically tested for leaf scorch resistance, but in recent years the disease has not been a serious problem in commercial plantings in Florida when the recommended disease control spray schedule is used (C. M. Howard, personal communication). Regardless of the variety selected, it is highly recommended that certified, disease-free plants be purchased, since other very serious strawberry pathogens, such as root knot nematode (*Meloidogyne hapla* Chitwood), red stele (*Phytophthora fragariae* Hickman), anthracnose (*Colletotrichum fragariae* A. N. Brooks), and *Verticillium* wilt (*Verticillium albo-atrum* Reinke and Berth.) can be completely avoided along with the risk of soil contamination to the degree that soil fumigation is necessary to produce a crop. Growing strawberries as an annual makes control of leaf scorch and other foliar diseases a simpler matter, since one need only select plants with healthy foliage to get a head start in disease control. In a small home garden bed, removal of infected leaves could be sufficient to control leaf scorch. For heavier disease pressure, or where labor-intensive practices are impractical, the following fungicides are labeled for use on strawberries (3): Benomyl, 1/2-1 lb in 100 gal/A, or 1-2 tsp/gal; copper fungicides, 3 lbs of 48-53% metallic copper in 100 gal, at 75-150 gal/A, or 6 tsp/gal; zineb dust, 20-35 lbs of 6 1/2% zineb dust/A, or 0.5 to 1.3 lb/100 sq ft; Captan 50% WP, 3 lbs in 100 gal at 100-200 gal/A or 3 tsp/gal. Fungicides should be applied at 7- to 14-day intervals, as needed. The copper fungicides are used primarily in commercial nursery beds, while the other fungicides are used on fields in fruit production.

SURVEY AND DETECTION. Look for small to medium-sized purple spots which in time enlarge to contain brown centers and affect much or most of the leaf. Black fruiting bodies of the pathogen appear on the upper surface of the lesions.

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