

Strawberry Leaf Scorch

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Introduction - *Diplocarpon earliana* is destructive to numerous cultivars of strawberry in temperate, subtropical and tropical regions, being widely distributed in North and South America, Europe, Central and Southern Africa, the Middle East, Southern and Eastern Asia, and Australia. Leaf scorch is reported to be the most prevalent disease of strawberry in Ontario, Canada, where epidemics normally occur from August to October and can markedly reduce vegetative growth and fruit yield in the subsequent season. Losses range from negligible to severe, depending on numerous factors, including cultivar susceptibility, type of cropping system, and weather conditions. Scorch can severely weaken plants, resulting in sharp growth declines for shoots and roots, and reduced numbers and vigor of crowns. Severely infected plants may die from environmental stresses, such as heat, cold or drought. Symptoms of this fungus are indistinguishable from leaf scorch caused by another member of the species, *Marssonina canadensis* Bolton, reported in British Columbia.



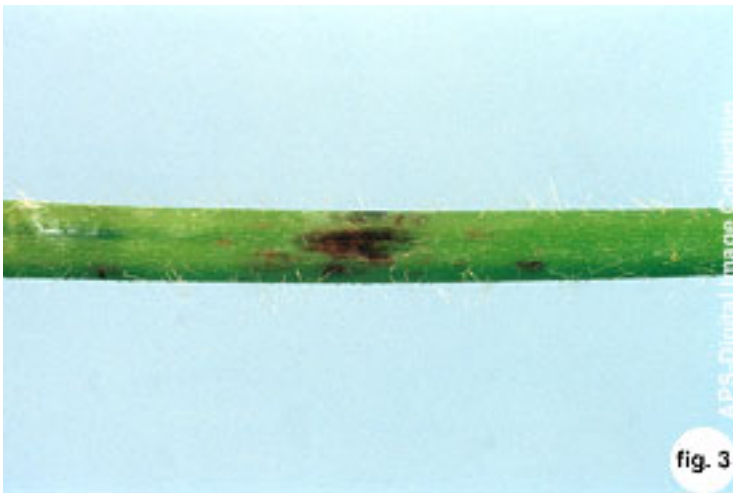
Early pin point leaf scorch lesions on strawberry leaves (Fig. 1). Advanced scorch symptoms on strawberry leaves (Fig. 2).

Symptoms

Leaves: Leaf spots (lesions) may take 2 forms: pinpoint lesions in large or small numbers, and blotchy type lesions measuring $\frac{1}{4}$ " to $\frac{1}{2}$ " in diameter (Fig. 1). Lesions are typically reddish to purple, coalescing to give a burnt appearance to the plants (Fig. 2). They often appear as numerous irregular, purplish to brownish blotches, 1-5 mm in diameter, developing on the leaf surface (laminae). The centers of these lesions do not become white or gray, as with leaf spot

(*Mycosphaerella fragariae*). The blotches coalesce irregularly when numerous and tissue between the blotches turns purplish to bright red. As the disease progresses, leaves turn brown, dry out and turn up at the margins, assuming a burnt or "scorched" appearance, as indicated in the name leaf scorch.

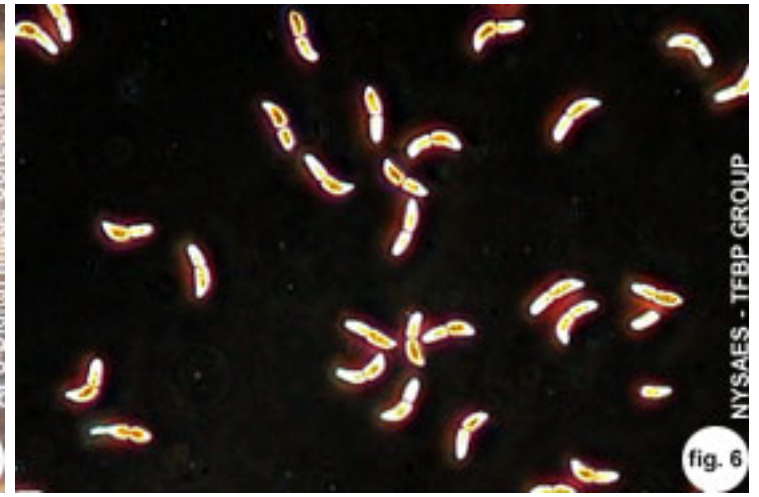
Leaf Stems (petioles): Lesions are typically elongated, sunken, purplish brown or reddish brown spots or streaks (Fig. 3). Advanced lesions can girdle the petiole and kill the leaf.



Early scorch lesions on strawberry stems (Fig. 3). Scorch symptoms on strawberry flowers (Fig. 4).

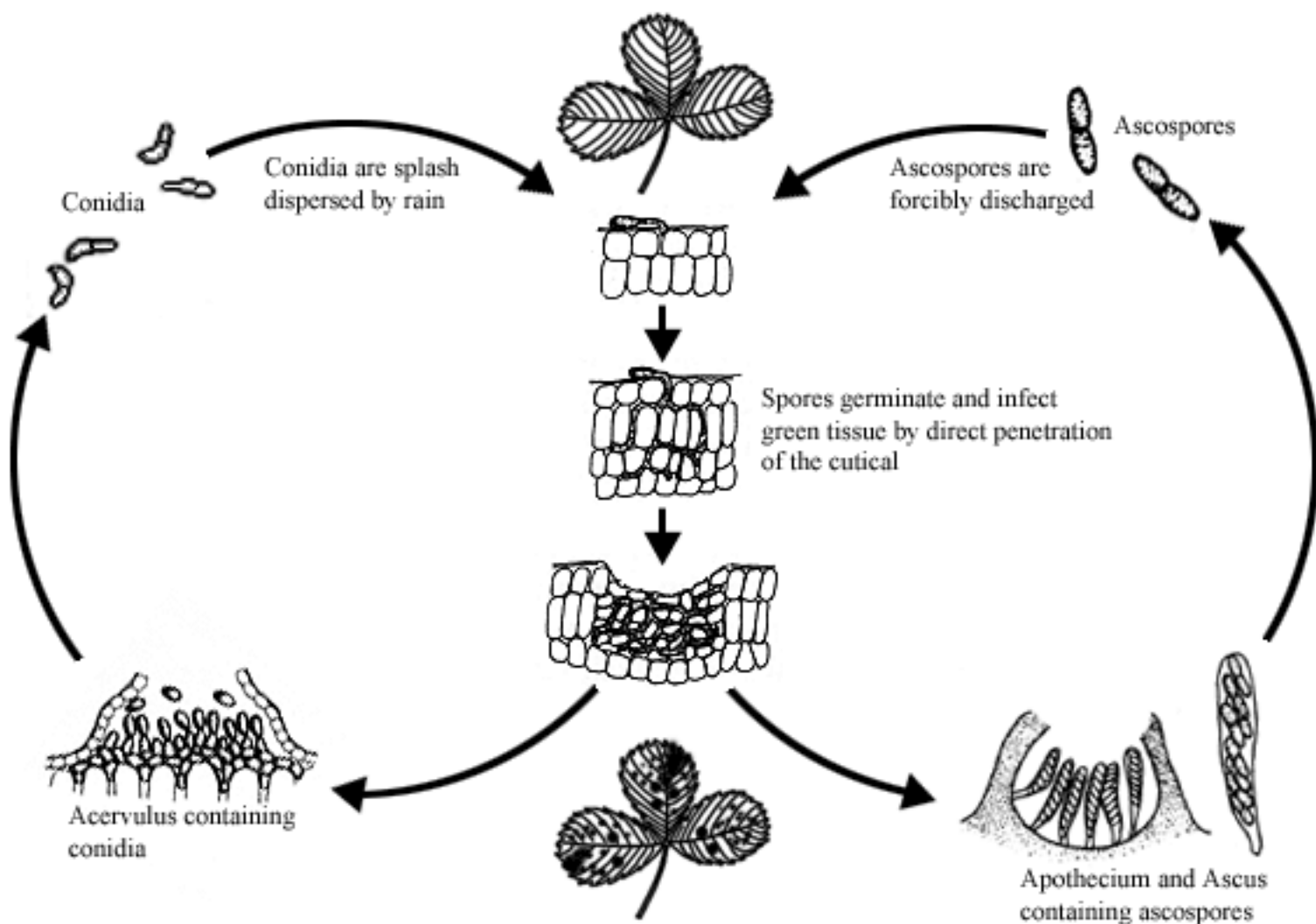
Fruit: All parts of the flower truss and fruits may be infected (Fig. 4). Peduncles and pedicels may develop elongated lesions and purplish streaks. In severe cases, tissues are girdled, resulting in death of flowers and fruits. Infected petals wither and fall off. Irregular brown areas form on infected sepals, often from the margins or tips. These infections lead to fruit with dead calyxes ("dead cap", "dead burr") which are less attractive to consumers, resulting in lower market grades.

Signs (visible presence of the pathogen) - Using a hand lens, look for small dark spots or fungal fruiting bodies (acervuli)(Fig. 5) with glistening spore masses (Fig. 6). As leaf lesions enlarge they may gradually resemble drops of tar due to production of large numbers of the minute black acervuli. Rarely, you might see apothecia develop on advanced lesions in leaves and strawberry leaf residues.



Asexual reproductive structure of *Diplocarpon earliana* (acervuli)(Fig. 5) containing hyaline crescent-shaped two-celled conidia. (Fig. 6)

Disease Cycle - Leaf scorch can progress year round in most climates but dry conditions, and temperatures above 95 °F and below freezing markedly reduce the rate of disease. In North America, scorch can continue to develop in foliage beneath snow cover at temperatures around 25 to 37 °F. Symptoms appear quickly on leaves of early growth in spring when scorch is more commonly severe, increasing in late spring and late summer to mid-fall. Infection by ascospores has received little attention. Acervuli can remain dormant for long periods in dry leaves but mature quickly during wet periods. The sticky conidia are dispersed from the acervuli by splashing rain, dew, sprinkler water and probably by arthropods. Conidia directly penetrate the cuticle, and develop into a subcuticular intercellular mycelium. Lesions begin to appear 6-15 days after infection at favorable temperatures (59-86 °F) provided a post infection wetness period of 9 hours occurs (18 hours for very young leaves). Mature acervuli form 1-25 days after infection when the microclimate is favorable (leaf age dependent).



Strawberry Leaf Scorch (Red Spot) Disease Cycle - some images reprinted from: Agrios G. N. (1997) Plant Pathology, 4th ed..Academic Press, San Diego, CA

Conditions Favoring Infection - Disease increase is favored by long periods of leaf wetness (>12 hours) at temperatures ranging from 59-77 °F and frequent rain.

Disease Management - Plant in light, well drained soil with good air circulation and exposure. Choose disease resistant cultivars suitable for your location ([Appendix of Strawberry Cultivar Disease Resistance](#)). Plant only disease free plants purchased from reliable nurseries. Apply nitrogen fertilizers only at renovation to reduce succulent new leaf tissue which is more susceptible. Carefully space runner plants in matted-row culture and control weeds in all plantings to improve air circulation and reduce drying time for leaves. Remove older or infected leaves before setting runners in new plantings. Removing and burning all debris at renovation (after harvest) helps to reduce overwintering inoculum of leaf pathogens. If leaf diseases are a problem in the planting, follow a fungicide spray schedule recommended for control of leaf diseases and fruit rots to aid in control. Thoroughly cover all above ground plant parts with

spray, especially undersides of leaves. For more information on fungicide programs see "Pest Management Guidelines for Commercial Small Fruit Production". Check product labels for timing and rates of application for products.

Reference List

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