

GRAPES



Disease Identification
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Angular Leaf Scorch of Grape

Pseudopezicula tetraspora Korf, Pearson & Zhuang

Roger C. Pearson

Department of Plant Pathology, NYS Agricultural Experiment Station, Cornell University

Angular leaf scorch was first described in 1985. Its symptoms are similar to those of rotbrenner, a disease of grapevines found in the cool grape-growing regions of Europe such as Austria, Germany, the Alsace and Champagne regions of France, and Switzerland. The causal fungi of angular leaf scorch and rotbrenner belong to closely related species.

Symptoms and Signs

The predominant symptoms of the disease are found on the leaves. Lesions first appear as faint, chlorotic spots and are most noticeable when the leaf is held against the sun. The secondary veins in these spots appear brownish. As the spots enlarge, they

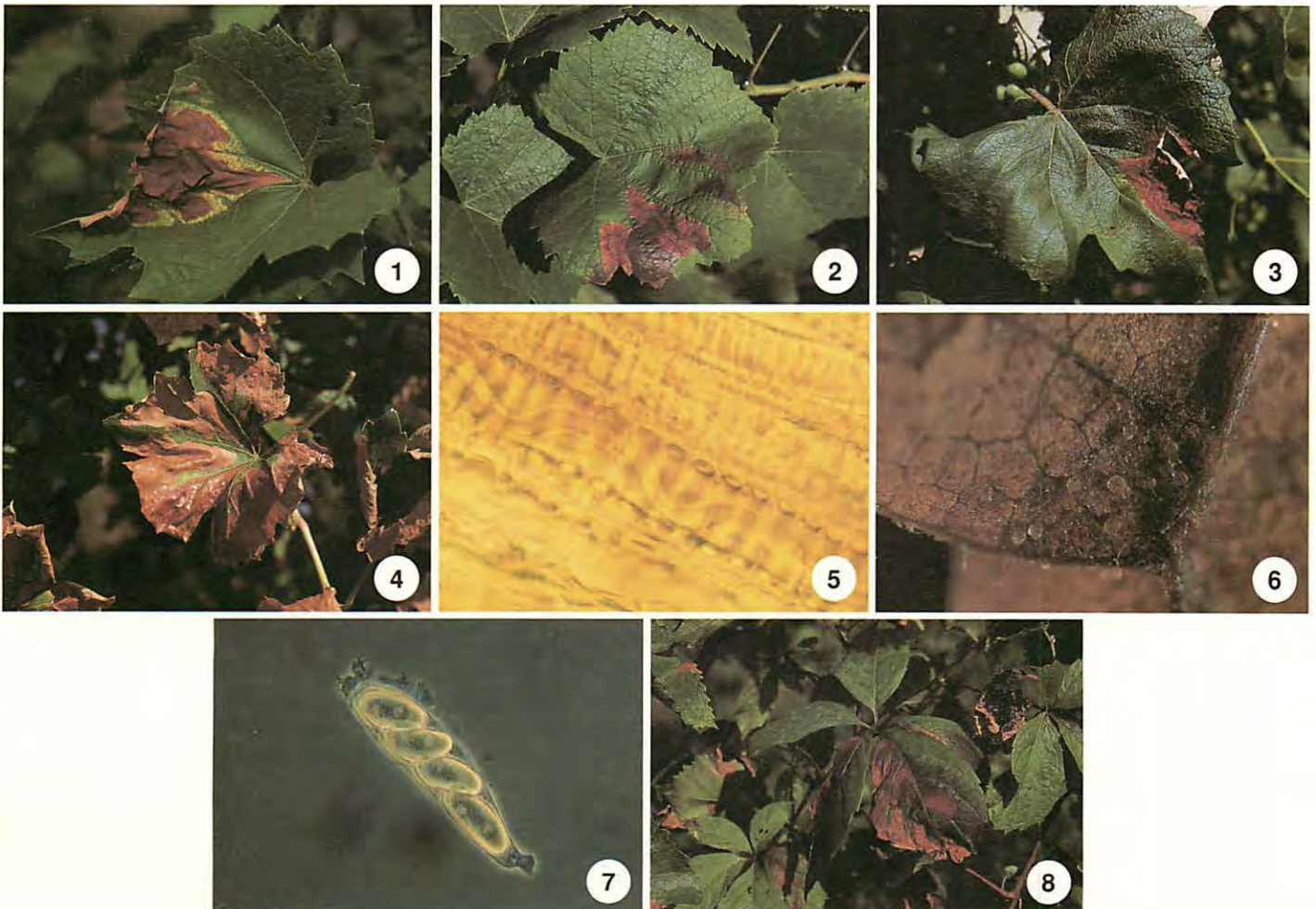
change from yellow to reddish-brown, and the tissue eventually dies. The lesions usually retain a yellow margin and are delimited by major veins (fig. 1). On red cultivars of *Vitis vinifera* such as Cabernet Sauvignon and Pinot noir a red margin develops between healthy and diseased tissue (fig. 2). Some American cultivars such as Concord may show only a slight yellow margin or none at all (fig. 3). In cases of severe infection, most of the leaf may be killed (fig. 4). Infected leaves frequently fall from the vine prematurely.

Microscopic examination of cleared tissue (boiled in 2 percent aqueous KOH for 2–3 minutes) from the margin between necrotic and healthy zones reveals characteristic hyphae of the fungus growing in sine wave patterns inside the vessel elements of diseased tissue (fig. 5).

Colorless, gelatinous fruiting bodies called apothecia are readily produced on dead leaf tissue when it is removed from the vine and placed on wet filter paper in a closed container for 3–4 days (fig. 6). The apothecia contain asci (saclike structures), each of which contains four binucleate ascospores (fig. 7).

Disease Cycle

The fungus survives winter in infected leaves on the vineyard floor. It produces numerous small apothecia on these leaves



during wet weather in spring. Between wetting events, the apothecia dry down, but they rapidly rehydrate when exposed to water. Ascospores are forcibly discharged into the air from the rehydrated apothecia at the end of rain events when the atmospheric humidity begins to decrease. Mature spores of the fungus are usually ready for discharge in spring when grape buds begin to grow. Ascospores that land on susceptible grape tissues infect when wetting duration and temperature are conducive. Characteristic leaf lesions appear 3–4 weeks after infection begins. The first foliar symptoms are usually seen in early June.

There is normally only one cycle of infection in spring, originating from apothecia formed on the overwintering leaves. Occasionally however, following several consecutive days of persistent rainfall, apothecia may be formed on the dead tissue of infected leaves still attached to the vine. These apothecia also provide ascospores that can cause secondary infections any time during the growing season when conditions are suitable.

Control

Cultivars vary greatly in their susceptibility to disease. Those classified as highly susceptible are *Aurore*, *Chancellor*, *Chelois*, *DeChaunac*, *Rougeon*, and *Ventura*. Cultivars classified as mod-

erately susceptible are *Baco noir*, *Canadice*, *Cayuga White*, *Chardonnay*, *Elvira*, *Missouri Riesling*, *Rosette*, *Seyval*, *Steuben*, and *Vignoles*. Those classified as slightly susceptible are *Catawba*, *Concord*, *Delaware*, *Dutchess*, *Foch*, *Fredonia*, *Gewürztraminer*, *Himrod*, *Ives*, *Niagara*, *Pinot noir*, *Remilly Seedless*, *Vidal blanc*, and *White Riesling*. *Virginia creeper* (*Parthenocissus quinquefolia*) (fig. 8) and the wild grape, *Vitis riparia*, are also susceptible to the disease and serve as reservoirs of the angular leaf scorch fungus.

Cultural practices that increase air circulation in the vineyard will help reduce prolonged periods of leaf wetness that favor disease development. Because the fungus overwinters in leaf litter, its destruction by cultivation before bud break can help reduce the incidence of disease during the growing season. Removal of wild vines and *Virginia creeper* in hedgerows and woods bordering vineyards may also help reduce sources of inoculum.

The disease can be controlled by applying fungicides before rainy weather. Applications should begin at 3 inches of shoot growth, and protection should be maintained through fruit set. Consult your local Cooperative Extension service for up-to-date control recommendations.

