Grape Phylloxera

Suzanne Wold-Burkness, Department of Entomology, University of Minnesota

Grape phylloxera, *Daktulosphaira vitifoliae* (Homoptera: Phylloxeridae), is a serious pest of commercial grapevines worldwide. There is both a root (radicole) and foliar (gallicole) form of this insect. Although the two forms behave differently, both belong to the same species of phylloxera that occurs on the leaves and roots of grapes. In Minnesota, only the foliar form is believed to cause damage since American varieties are tolerant to the root form of phylloxera.

Grape phylloxera is thought to have originated in the Eastern United States, where damage is now most prevalent on leaves of French-American hybrid grapevines. High populations of foliar phylloxera can result in premature defoliation, reduced shoot growth, and reduced yield and quality of the crop.

**Identification**

Adult grape phylloxera are tiny aphid-like insects with a yellow body. The foliar form of grape phylloxera causes the formation of tiny galls to form on the leaf. The galls extend below the leaf surface and fully enclose the insect. The gall opens to the upper leaf surface which allows the nymphs to exit.

**Biology & Life Cycle**

The foliar form of phylloxera overwinters as eggs under the bark of grapevines. Egg hatch coincides with leaf emergence and expansion in the spring. The nymphs, which are referred to as crawlers, are mobile and move between leaves to establish new feeding sites. Feeding by nymphs induces the formation of galls on the leaves. After the first instar, the nymphs tend to feed in one place. There are four instars prior to the wingless adult stage. Multiple generations are observed each year.
**Damage**

Foliar phylloxera can reduce the photosynthetic activity of grape leaves. In addition, the leaf galls cause distortion, necrosis, and premature defoliation. Premature defoliation may delay ripening, reduce crop quality, and predispose vines to winter injury. Populations must reach very high densities before yield is affected, and this is rare. The impact of infestations over years on the overall health and vigor of the vine is unknown.

Feeding by root phylloxera on European grapevines, *Vitis vinifera* nearly destroyed the French wine industry in the late 1800's. The epidemic was eventually brought under control by grafting *V. vinifera* varieties onto resistant American, *Vitis labruscana*, rootstocks. A major resistance breeding program conducted in Europe targeting the root form of grape phylloxera resulted in grape varieties commonly referred to as French-American hybrids. French-American hybrids are important in eastern North America for wine production, but some are particularly susceptible to foliar grape phylloxera.

**Management**

**Cultural**

The root form is effectively managed by using resistant or tolerant rootstocks. However, once an infestation occurs, eradication of phylloxera from a vineyard is unlikely, but steps can be taken to keep the infestation at a tolerable level.

**Monitoring**

Vineyards should be scouted for the foliar form on infested leaves after shoot length has reached five inches. Small galls will be evident on the underside of the terminal leaves.

**Chemical**

Control of the foliar form of phylloxera may be achieved by applying insecticides during the bloom stage. Early season control of this pest is critical. Several insecticides provide good control of grape phylloxera, and can be found in the *Midwest Small Fruit Pest Management Handbook*. 
References


