

# grape leafhopper

*Erythroneura comes* (Say)

## INTRODUCTION

Three leafhopper species can be found feeding on grapes in the Northeast: *Erythroneura comes* (Say), commonly known as the grape leafhopper (GLH), *E. tricincta* Fitch, the threebanded leafhopper, and *Empoasca fabae* (Harris), the potato leafhopper. Of the two *Erythroneura* species, *E. comes* is the dominant species in most areas of the Northeast. In contrast to the GLH and *E. tricincta*, the potato leafhopper does not overwinter in this area. It is an annual migrant from the south and usually appears around mid-June in this region. In some years *E. fabae* can be more destructive than the GLH.

The GLH has 1 1/2 to 2 generations per year. It overwinters as an adult in non-cultivated areas adjacent to vineyards, preferring dry, elevated, sheltered sites with accumulations of plant debris. Wide fluctuations in abundance between localities and from year to year are common.

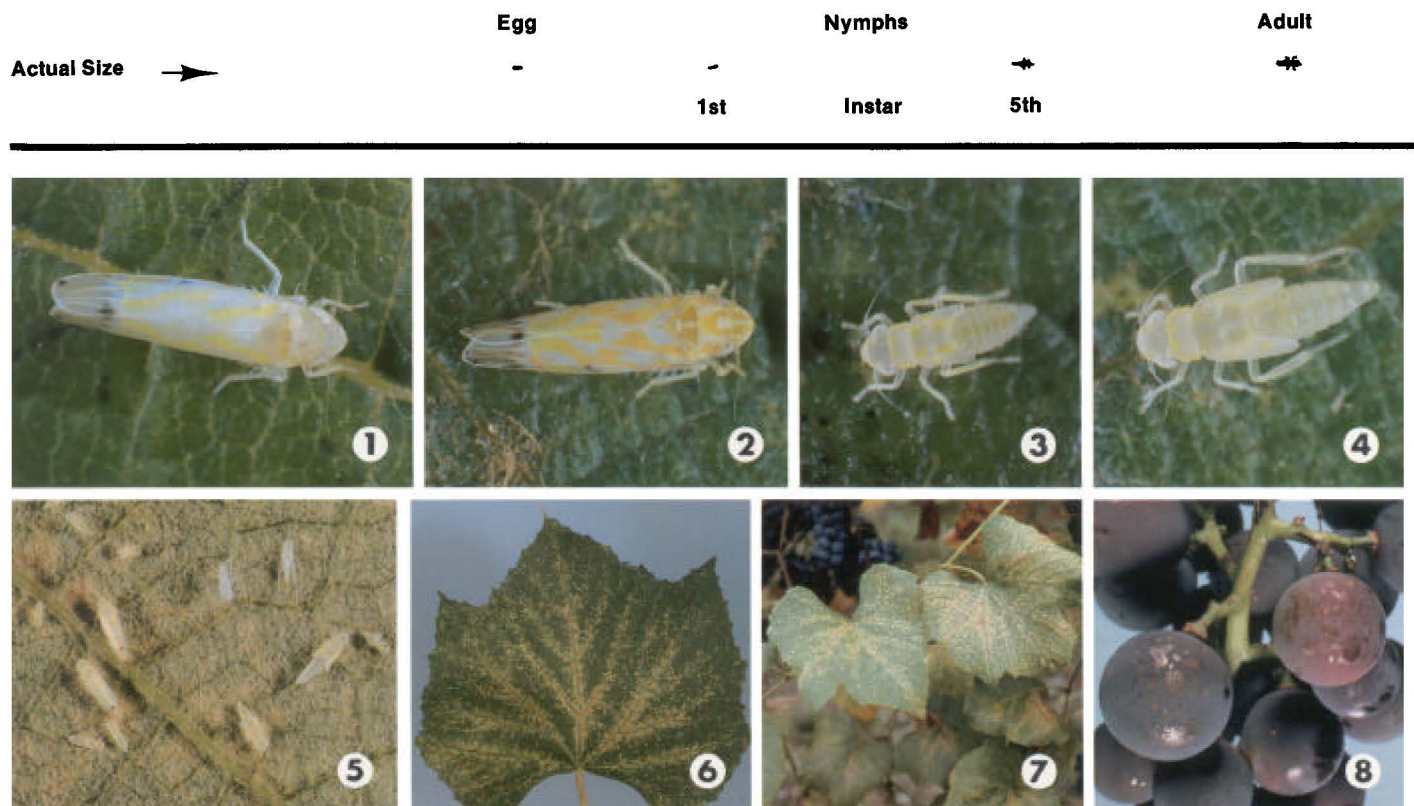
As spring temperatures in May reach the mid-60s, the overwintering adults emerge from hibernation and begin feeding on various plants such as strawberry, the various berry bushes, catnip, Virginia creeper, burdock, beech, and sugar maple. The leafhoppers mate but don't reproduce on these plants. They remain there until new growth develops in the vineyard. In western NY, migration to the grape vines begins in late May and continues through mid-July.

Generally, the 3 mm long adults emerge from hibernation with a reddish-orange coloring which changes to yellow when they begin feeding. The summer form of the GLH adult is pale yellow with three black spots and some zig-zag lines of deeper yellow on the forewings (Fig. 1). As the season continues the markings darken and just prior to hibernation the insect becomes salmon-colored overall with red eyes (Fig. 2).

The GLH is found in the vineyard into the fall. Migration to overwintering sites begins the latter part of October and continues into December.

## THE EGGS

The eggs of the GLH are laid singly just beneath the epidermis on the underside of the grape leaf producing a slight blister. They are tiny (0.8 mm in diam.), colorless, and slightly bean-shaped. Egg laying usually begins during mid- to late June.



## THE NYMPHS

The first nymphs appear in late June and reach the adult stage by late July. The second generation nymphs and adults are found in late August.

There are five nymphal instars. A few days before hatch a dark eye spot can be seen in the egg. Newly hatched nymphs are semi-transparent with conspicuous red eyes. The eye color of second instar nymphs is less intense, and their thorax turns yellow and shows small lateral wing pads. With successive molts, the markings on the thorax become more prominent and the wing pads become larger (Figs. 3 & 4). After the fifth molt, the fully formed wings appear, extending beyond the tip of the abdomen.

Nymphs as well as adults are very active, especially on hot dry days, and are easily disturbed. During the summer all stages and the cast nymphal skins can be found on the lower leaf surface (Fig. 5).

## INJURY

Adults as well as immature leafhoppers feed on the underside of leaves by sucking out the liquid cell contents. The tissue surrounding the feeding puncture turns pale white and eventually dies. Feeding injury shows up first along the veins (Fig. 6) but later the whole leaf is affected (Fig. 7). Feeding is limited initially to the lower leaves.

Grapevines can tolerate populations of up to 15 hoppers per leaf with little or no economic damage. However, heavy leafhopper feeding can result in premature leaf drop, lowered sugar content, increased acid, and poor color of the fruit. Ripening fruit is often smutted or stained by the sticky excrement ("honeydew") of the hoppers, which affects appearance and supports the growth of sooty molds (Fig. 8). Also, severely infested vines may be unable to produce sufficient wood the following season. Damage to the vine can be serious if infestations are allowed to persist unchecked for two or more years.

## CONTROL

The GLH has few natural enemies. Cold and wet weather conditions in spring and fall are damaging to leafhopper populations, as are wet winters. Fall cultivation and clean-up of adjacent weedy land will eliminate favorable overwintering sites in and near a vineyard.

When the GLH appears in high numbers the application of a contact insecticide may become necessary. For good GLH control it is important to obtain complete spray coverage of the undersides of the leaves. Coverage of the fruit clusters is of secondary importance.

### GUIDE TO STAGES

STAGE	TIMING	WHERE TO LOOK
Adult Overwintering	Late October until May of the following year	Under fallen leaves and debris in dry, sheltered areas in or adjacent to vineyard.
	In May when temperatures reach 18 C (65 F)	On spring food sources; migrate to vines when leaf growth begins; found on underside of basal leaves.
Adult	Late July through November	On underside of grape leaves.
Egg	Mid-June through mid-August	Beneath epidermis on underside of grape leaves.
Nymphs	Early July through October	On underside of grape leaves.