



Recent Advances in Management of Virginia Creeper Leafhopper (*Erythroneura ziczac*)

Houston Wilson, UC Berkeley: houston@berkeley.edu

Lucia Varela, UC IPM: lgvarela@ucanr.edu



Virginia Creeper Leafhopper (VCLH) is a recent (2011-2012) pest of vineyards in northern California, where outbreaks can occur due to a lack of biological control by the parasitoid *Anagrus daanei* (Hymenoptera: Mymaridae). When this occurs, insecticides are required to control VCLH populations. Guidelines for identification can be found at <http://ucanr.edu/sites/vclh/>

Product Selection and Spray Timing

Chemical controls used for WGLH can be effective against VCLH, but the timing of sprays must be adjusted to target the first brood of VCLH.

VCLH is well controlled by one, properly timed application of a neonicotinoid insecticide or an insect growth regulator (IGR). Our studies indicate that in organic vineyards oil and pyrethrin are the most effective treatments. *Oil applications* are most effective against the younger nymphal stages (1st to 3rd instars) of the first brood, but two applications may be needed. *Pyrethrin* is most effective during peak emergence of first brood nymphs; this typically occurs when the later stage nymphs (4th instar) begin to appear. For both products, it is important to have good coverage. Since IGRs, oils and pyrethrin target nymphs, *early season sprays* are more effective because the first VCLH brood is relatively well synchronized (i.e. eggs, nymphs, adults; see Fig. 1).

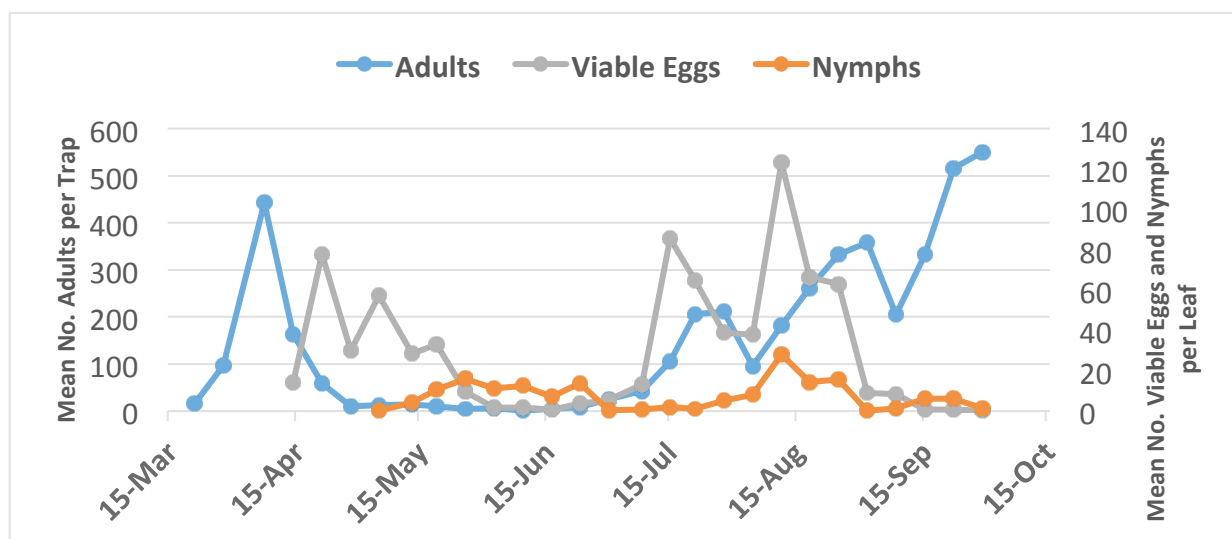


Figure 1. Example of seasonal VCLH population trends. The life-stages (adult, egg, nymph) are relatively distinct early in the season, but overlap in the late season. The exact timing of adult flights, egg deposition and nymph emergence varies each year.

Cultural Practices

VCLH prefer varieties with glabrous leaves (few/no leaf hairs) such as Grenache, Chardonnay and Sauvignon Blanc. Moderation of vine vigor is also important, since *Erythroneura* leafhoppers have been shown to prefer vines with increased irrigation levels and/or nitrogen content.

Biological Control

The primary VCLH parasitoid is *A. daanei*, which is < 1 mm in size. This tiny wasp lays its egg inside the leafhopper egg (Fig. 2A) and consumes its contents as the larva develops. Once it completes development (Fig. 2B), an adult wasp emerges from the remains of the leafhopper egg (Fig. 2C).

While this parasitoid is present in the North Coast, VCLH eggs in Mendocino and Lake County have not been observed being parasitized by *A. daanei*. We are currently in the process of introducing *A. daanei* from the Sacramento Valley (where they readily attack VCLH) into North Coast vineyards.

During the growing season, the parasitoid reproduces on vineyard leafhoppers, but to successfully overwinter it must seek out the eggs of an alternate leafhopper host, which is typically found in natural habitats outside of the vineyard. A recent survey in the North Coast ([Wilson et al. 2016](#)) found that *A. daanei* overwinters in the eggs of alternate leafhopper species found on blackberry (*Rubus* spp.) and roses (*Rosa* spp.).

Anagrus daanei Parasitizes VCLH Eggs



Figure 2. (2A) *A. daanei* parasitizing a VCLH egg; (2B) parasitized VCLH eggs: the two dark spots at the tip of each egg are the eyes of the adult *A. daanei*; (2C) *A. daanei* emerging from VCLH eggs: the parasitoid chews a hole in the top of the egg and emerges over ca. 30-45 minutes.