

# Evaluation of Potato Leafhopper, *Empoasca fabae* L., Populations in Arizona Citrus

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## Abstract

*The potato leafhopper, Empoasca fabae L., is a significant pest in the United States, and elsewhere, of alfalfa and potatoes. In Arizona and in Coastal and Central California it can also be a pest of citrus. In 1994 and 1995 we collected information concerning their seasonal abundance in a large citrus orchard near Newman Peak Arizona. To do so we employed yellow sticky traps around the orchard periphery, at the same time using a D-Vac® vacuum sampler in the weeds growing in the interior of the orchard. During both years peak populations occurred near mid-April. This was correlated with a drop in relative humidity and a rise in ambient air temperature.*

## Introduction

The biology of the potato leafhopper, *Empoasca fabae* L., has been closely examined on various legumes and potatoes (Roitsch and Gage 1990, Hoffman 1991, Elden and Lambert 1992). Although they are occasional pests of citrus in Arizona and California, they have not been well studied on this crop. Of the 67 references found in the literature since 1989, none have dealt with this insect on citrus.

Adult potato leafhoppers are usually yellowish or pale green. They exhibit a great deal of color variation, which often leads to misidentification. The head of the adult often has pale or dark green spots, and six or more pale (white) spots can be found on the back immediately behind the head. They are white to pale white, slender, elongated, and about 0.9 mm long. Nymphs are similar in shape to the adults but are smaller and lack wings. There are five nymphal instars. Although found throughout much of the United States they are primarily distributed east of the Rocky Mountains. Their populations in Arizona seem to be limited to the south-central portion of the state. Small populations were found in western Arizona near Tacna.

The potato leafhopper feeds on a variety of plant species and has been reported to feed on nearly 200 kinds of plants. Feeding and egg laying cause damage. On citrus in this state most problems are associated with larger nymphs feeding on developing fruit. Feeding punctures later result in a brown rough scar.

Adults live about one month, but have been recorded as living as long as 120 days. Females mate within 2 days after their final molts and begin laying eggs about 6 days afterwards. An entire life cycle can be completed in about 4 weeks, and as many as six generations may occur each year.

## **Methods and Materials**

During both years a series of yellow sticky cards were placed at seven locations around the periphery of an irregularly shaped citrus orchard. At each location a trap was placed at ground level and at approximately 1.2 m. Traps were in place from February 24 until June 15 in 1994 and from February 17 until June 8 in 1995. Traps were in place for 24 hours during each week. In addition, during 1995 a D-Vac® vacuum sampler was used to collect insects from the weeds growing in the interior of the orchard. This was accomplished by measuring a 20-m strip between rows and then attempting to collect as many insects as possible from the weeds found there. This was replicated four times during each weekly visit.

Weekly weather data from the closest AZMET station were monitored to determine the impact of these parameters on insect populations.

## **Results and Discussion**

During both years potato leafhopper populations peaked during the first part of April (Figures 1 and 2). This peak in 1994 seemed to be associated with a steep drop in relative humidity and increase in ambient air temperature.

When we attempted to correlate insect numbers from sticky trap samples with those from D-Vac®, no relationship could be found. This is likely due to sampling error, since four 20 m replicates probably do not reflect conditions found in the entire orchard.

We conclude that sticky traps near the orchard edge provide an accurate assessment of when leafhoppers are entering the orchards from neighboring cropping areas. Sticky traps are primarily used to collect flying adult insects and we found very few nymphs on our traps.

Our recommendation to the local grower was to apply dimethoate to the orchard from mid to late March to prevent the buildup of leafhopper populations. This was thought to be particularly important for that portion of the orchard that was bordered by cotton, since that is a known source of potato leafhopper. This was reported as being effective in 1995. Due to weather conditions, yields were low during 1996 and control measures were not taken.

## **References**

- Roltsch, W.J. and S.H. Gage. 1990. Potato leafhopper (Homoptera: Cicadellidae) movement, oviposition, and feeding response patterns in relation to host and nonhost vegetation. *Environmental Entomology* 19: 524-533.
- Hoffman, G. 1991. Potato leafhopper (homoptera: Cicadellidae) life history traits on water-stressed alfalfa in the early regrowth and bud stage. *Environmental Entomology* 20: 1058-1066.
- Elden, T.C. and L. Lambert. 1992. Mechanisms of potato leafhopper resistance in soybean lines isogenic for pubescent type. *Crop Science* 32: 1187-1191.

Leafhopper Counts  
Site B Summary

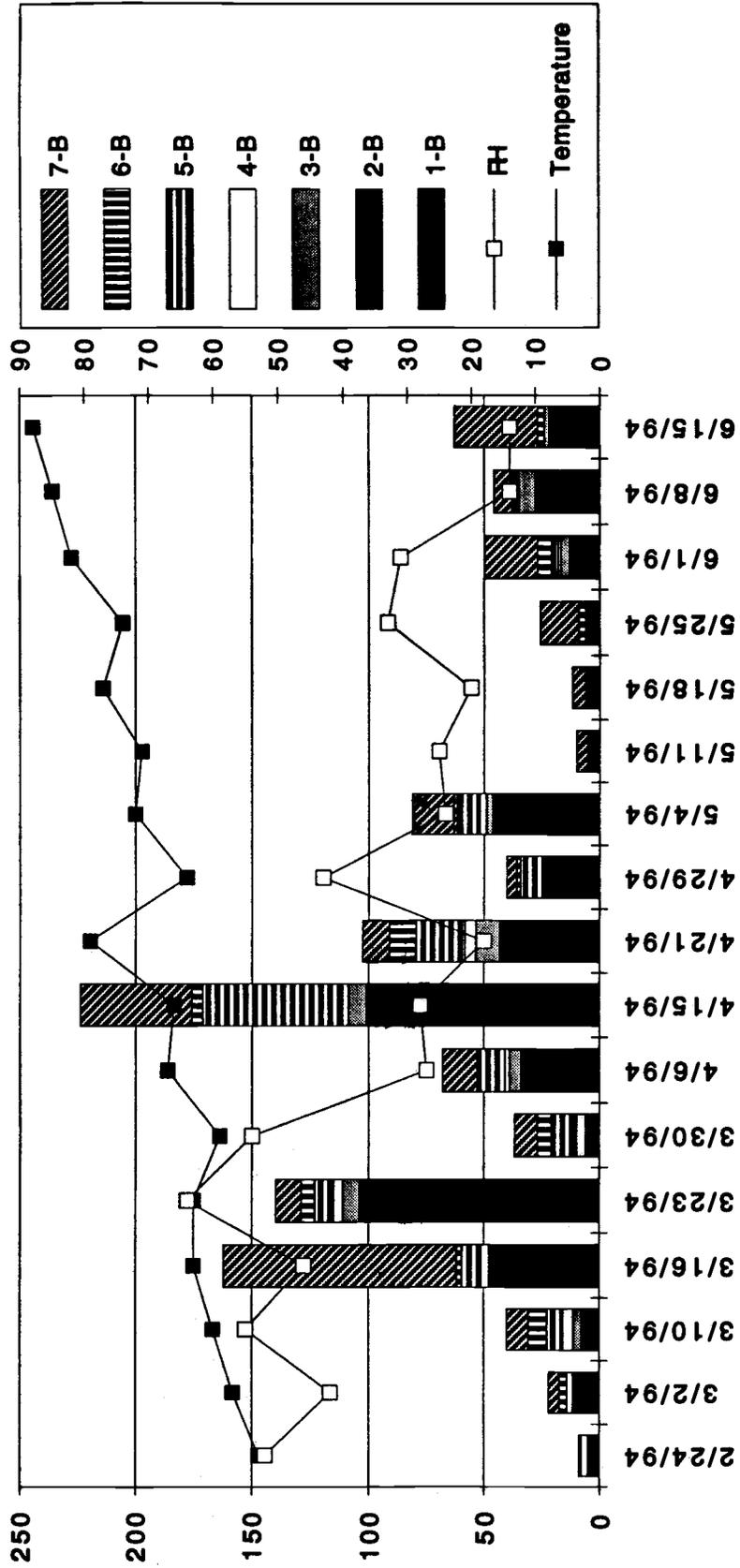


Figure 1. Sticky trap collections of potato leafhoppers taken near Newman Peak in south central Arizona during 1994.

### "Sticky Trap Data"

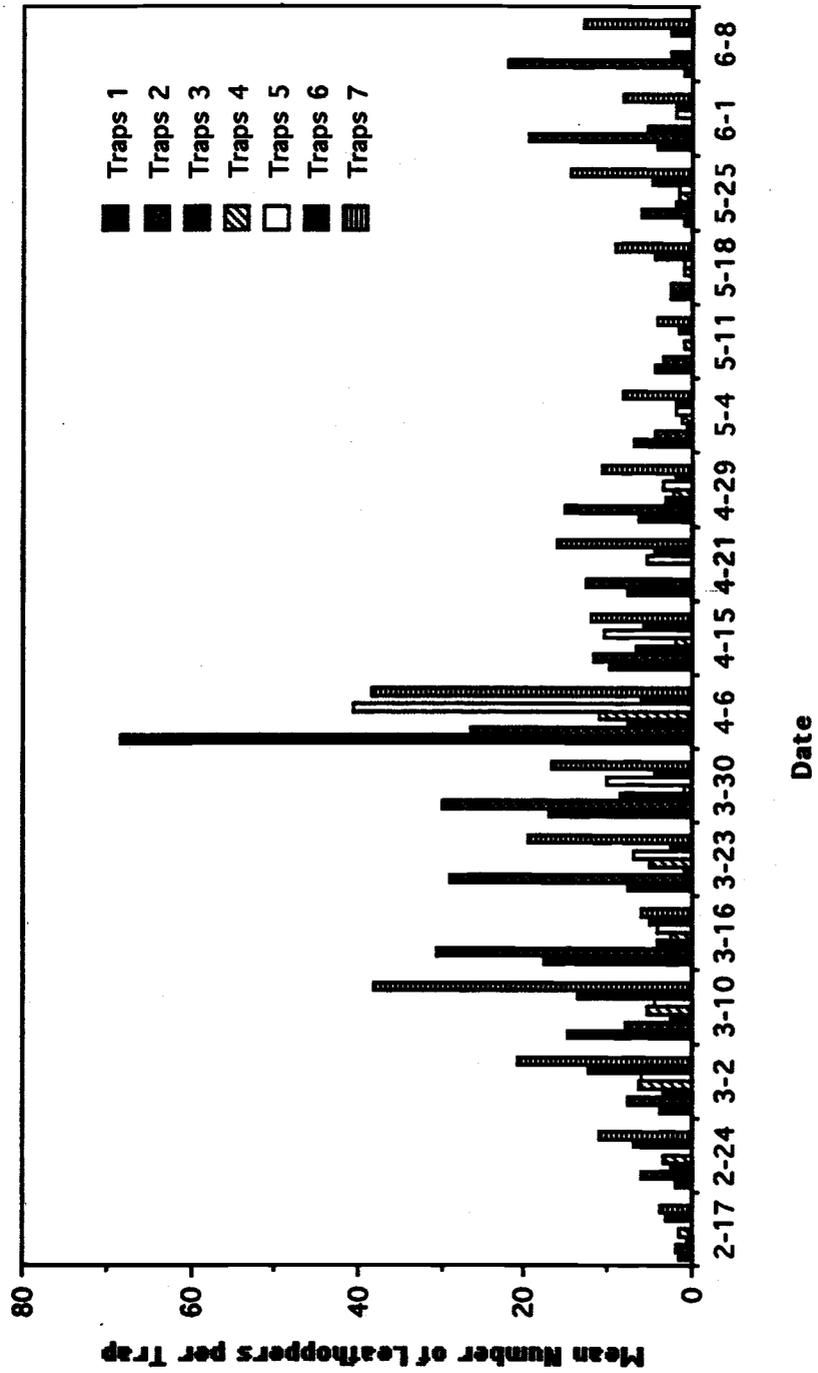


Figure 2. Sticky trap collections of potato leafhoppers taken near Newman Peak in south central Arizona during 1995.