

## Introduction

- The Huanglongbing (HLB) disease is the most destructive and devastating disease in citrus orchards. The disease is caused by the bacteria *Candidatus Liberibacter* which is transmitted through the insect *Diaphorina citri* (Hemiptera: Psyllidae) (Fig. 1 + 2) worldwide and in Mexico.
- Symptoms include yellow spots on the leaves and fruits abort early and are less sweet.
- Control in general and organic agriculture is difficult.

### Research questions:

1. Is it possible that a special composition and biodiversity of weeds: a) decreases the population of *D. citri* and b) increases the population density of the natural enemies?
2. How does the management of weeds affect weed biodiversity?



Figure 1: Adult stage of *D. citri*



Figure 2: Fifth nymph stage of *D. citri*

## Materials and Methods

- Study was conducted on a 4 years organic orange orchard in the district Veracruz in east Mexico.
- Data inventory was held from mid February till end of march 2017 when *D. citri* propagate on young spouts.
- Two treatments: alternate weed management (each second row was cut) and low mowing weed management, each with 6 repetitions.
- Vector: counted 5 times on 4 branches of 3 already determined trees per repetition.
- Insects and Beneficial's: 5 times visual observation of beneficial's on same branches as *D. citri*, other arthropods were caught with sweep net (20 sweeps) around determined trees.
- Plant composition: 3 times per plot a systematic line sampling in form of a cross in the centre of each repetition was done whereby 10 m<sup>2</sup> were sampled.

## Results

- Plant composition: No difference in Shannon-Wiener (2.89) and Simpson (0.92) index and higher evenness for alternate weed management (0.92 compared with 0.69) (Fig. 3). Overall five assertive weed species made the majority out

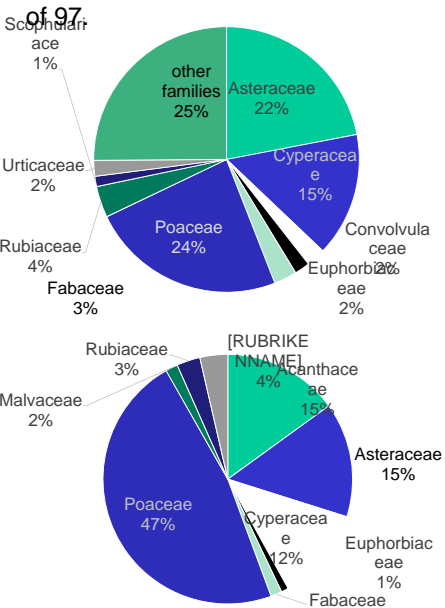


Figure 3: Distribution of plant families in low mowing weed management (above) and in alternate weed management (down) in %

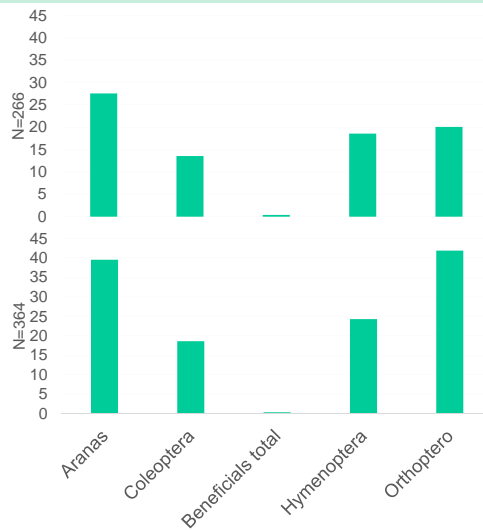


Figure 4: Distribution of Arthropod orders in low mowing weed management (above) and in alternate weed management (down) in mean number

- Arthropods: No significant differences towards beneficial insects. In general higher numbers of most arthropod orders in alternate weed management (Fig.4)
- *D. citri*: Higher growth rate in alternate weed management (0.79 in contrast to 0.64) (Fig. 5). In both treatments nymph stages of *D. citri* (Fig. 2) were found in weed.

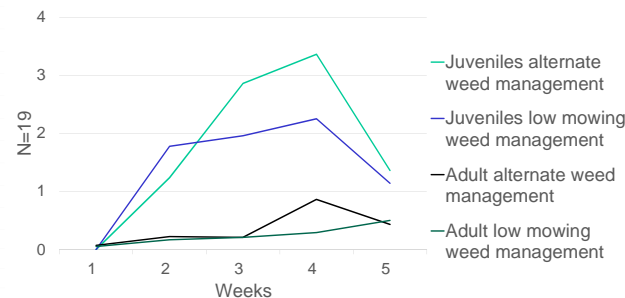


Figure 5: Quantity of adult and nymph stages of *D. citri* in low mowing and alternate weed management

## Conclusions

- Random sampling for arthropods and *D. citri* will generate better results.
- No significant results yet, longterm trial will be necessary.
- Weed management against assertive and citrus affecting weed species is advisable.
- Maybe sowing of beneficial insects attracting weeds will lead to a higher arthropod diversity and will generate more beneficial organisms.
- Further research concerning plant species supporting beneficial insects and attracting *D. citri* is required.

Sources: picture *D. citri* adult and juveniles: <http://www.citricaldas.com.co/principales-caracteristicas-de-diaphorina-citri/> 12.9.2017