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## Ecofunctional Management Strategies for *Diaphorina citri* on Organic Orange Orchards

LEA FORSTER<sup>1</sup>, CARLOS CASTILLEJOS CRUZ<sup>2</sup>, SALVADOR GARIBAY<sup>3</sup>

<sup>1</sup>University of Kassel, Georg-August-University of Göttingen, Germany

<sup>2</sup>National Autonomous University of Mexico, Botany,

<sup>3</sup>Research Institute of Organic Agriculture, Department for International Cooperation,

### Abstract

This study was conducted to develop eco-functional management strategies on organic citrus orchards. The citrus Huanglongbing (HLB) or greening disease is considered as the most destructive and devastating citrus disease worldwide. The bacteria *Candidatus Liberibacter* is the causal agent for the disease and mostly disseminated by the Psyllid *Diaphorina citri*. Therefore, this research explores potential difference in the quantity of natural enemies concerning *D. citri* in two different -weed- management systems on organic citrus production. The weed management included i) an alternate weeding, ii) and a frequent and low weeding, both within the tree rows. The on-farm study was conducted in Mexico, Veracruz on a 2 years old organic orange (var. Valencia) orchard under a systematic line sample design. Data was taken from 5<sup>th</sup> of February till the 18<sup>th</sup> of March. Measurements were conducted in total 3 times for the weed composition and 5 times concerning Arthropode diversity. Along transects randomly ten square metre of floral composition were determined on species level. Afterwards the alpha and beta biodiversity are calculated with the Shannon-Wiener index, the evenness and the beta biodiversity with the Jaccard's index. *D. citri*, Coccinellidae and Crysopidae were observed on 4 sprouts of each 3 selected tree/treatment with a magnifying glass of 10x of 3. With an insect net, the arthropode populations of the ground between the trees were caught and placed into polyethylene bags with alcohol 70%. Afterwards, the insects were counted and divided into the different order level. Preliminary results shown that there was no difference in the weed composition concerning family level. The species number was on the second and third observation date much higher in the treatment with alternate weed management, 150 and 140 species against 96 and 116 in the low weed management. *D. citri* population was not significantly different among treatments (correlation of 0.34). However, the amount of *D. citri* was lower in the alternate weeding compared with the frequent weeding at the third observation date, later the mean is nearly the same and higher. The amount of natural enemies decreased strongly after the second observation and was the same for both treatments.

**Keywords:** Beneficial insects, *Diaphorina citri*, eco-functioning, huanglongbing, management