



# Biological control as a Key tool for IPM in citrus

Training Course- Caribbean

Dr. Yelitza Colmenarez (CABI), Dr. Eduardo Hidalgo (CABI), Msc. Nelson Laville (MoA-Dominica)

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# Training course content

## Session 1: Biological control as a Key tool for IPM in citrus

Day 1: October 6<sup>th</sup> - CABI Team –Invited Speaker Msc. Nelson Laville (MoA- Dominica)

Moderator: Mr. Naitram Ramnanam (CABI)

Time	Topic	Speaker
09:00 - 09:05 am	International Year of Plant Health	Video IYPH 2020
09:05 - 09:10 am	Welcoming words	Dr. Hariet Hinz – Regional Director- CABI Americas
09:10 - 09:50 am	Introduction to the training course & Review of Impact of Citrus Greening	Dr. Yelitza Colmenarez (CABI)
09:50 – 10:30 am	Implementation of Biological control in the Caribbean as a key tool for invasise specie management: Potential and challenges	Dr. Yelitza Colmenarez (CABI)
10:30-10:40 am	Break	
10:40 – 11:00	Micro-biological control and its use in the Caribbean	Dr. Eduardo Hidalgo (CABI)
11:00-11:30 am	Status of the management of Citrus Greening in the Caribbean – Dominica case study	Msc. Nelson Laville- Dominica Ministry of Agriculture
11:30 – 12:00 am	Biological control programs in the Caribbean and its importance in sustainable production	Dr. Yelitza Colmenarez (CABI)
12:00-12:15 am	Final Remarks	All



# Citrus Greening Management

- **Session 1:** Introduction to the importance of Biological control as part of the sustainable pest management strategies
  - Natural Enemies
  - Micro-Biological Control - Entomopatogens
- Impact of the citrus greening disease in LAC
- Review of the different management strategies- Case study from the Caribbean – Dominica
- Review the Biological Control programmes in the Caribbean and discuss the challenges and the potential



# Citrus Greening Disease- Global distribution



Source: CABI 2020

LAC- 1998 – Guadalupe....

# Presence in the Americas & Caribbean





## Citrus Greening Disease

- It is caused by the bacterium *Candidatus Liberibacter asiaticus* (CLAs) and vectored by the Asian citrus psyllid (ACP), ***Diaphorina citri*** Kuwayama (Hemiptera: Liviidae)
- Once detected in a country, its impact on citrus production is significant
- Affects citrus trees in major citrus production areas around the world, including the United States, Brazil, Asia, Africa, and the Arabian Peninsula.
- Cause the reduction of production level
- Affect the quality of the fruits produce



# Citrus Greening Disease- Impact

- Occurrence of the Citrus Greening disease in Florida has caused decreasing in citrus production in by 74%
- In Florida alone, HLB has caused a cumulative loss of \$2.994 billion in grower revenues over the 2006–2007 to 2013–2014 period, an average of \$374 million per year (Hodges et al., 2014).
- In Mexico, in the first year since HLB was detected, the disease reduced the yield of infected trees by up to 50%; and it is estimated that, within five years, under a high-impact scenario, the potential losses in producer zones would be about 3 million tons, equivalent to 41% of the country's total production.
- In Brazil, since it was first reported in 2004 in São Paulo, the disease has spread and approximately 3 million trees were eliminated in attempts to limit its spread in Brazil (Bassanezi et al., 2009).



*Diaphorina citri* Kuwayama (Hemiptera: Liviidae)



Source: Senasica.gob.mx



# Supression of the pest population

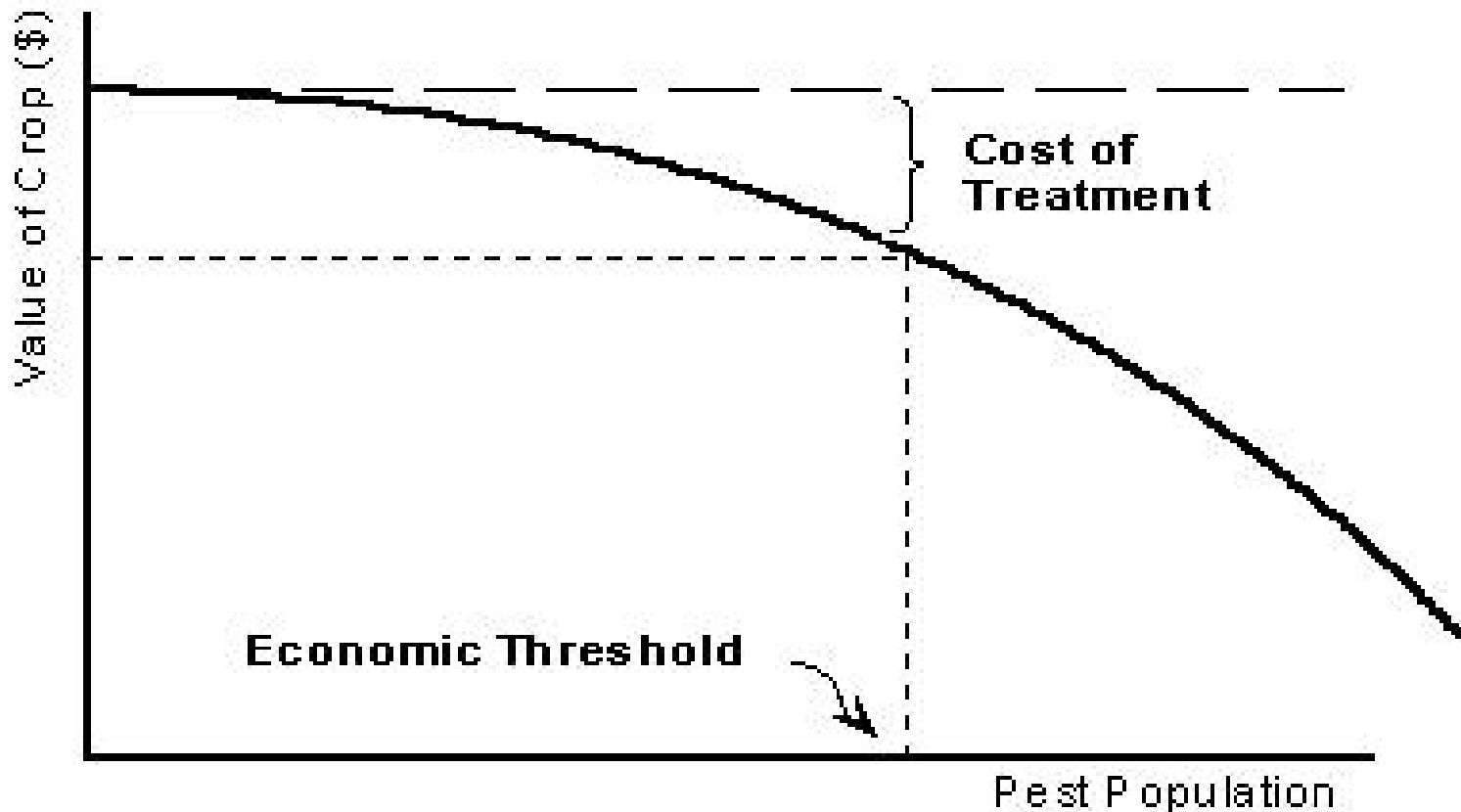
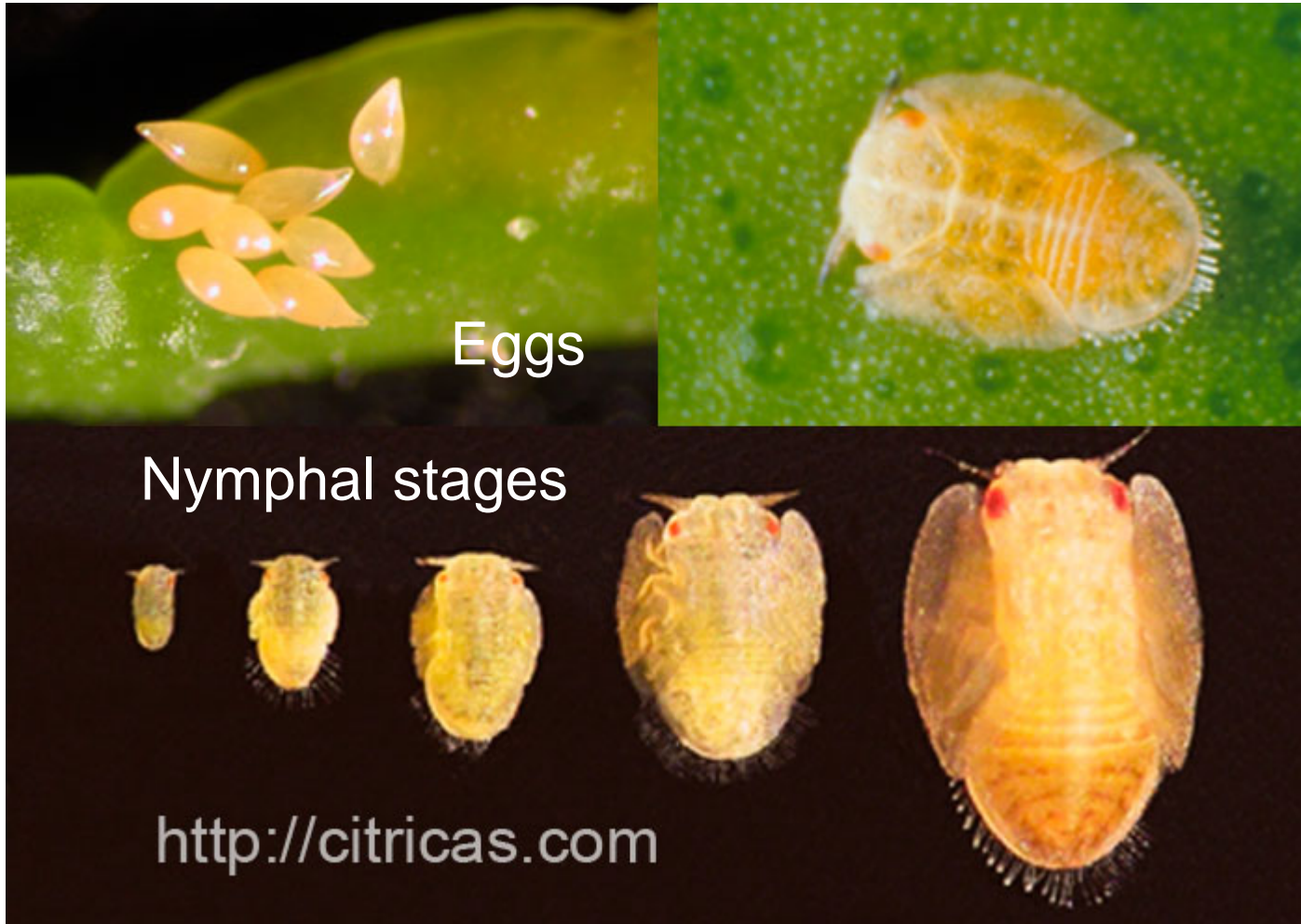


Figure 2.2 Economic Threshold, Value of Crop and Cost of Treatment (adopted by Glass, 1975)

# *Diaphorina citri* - Biology





# Biological Control

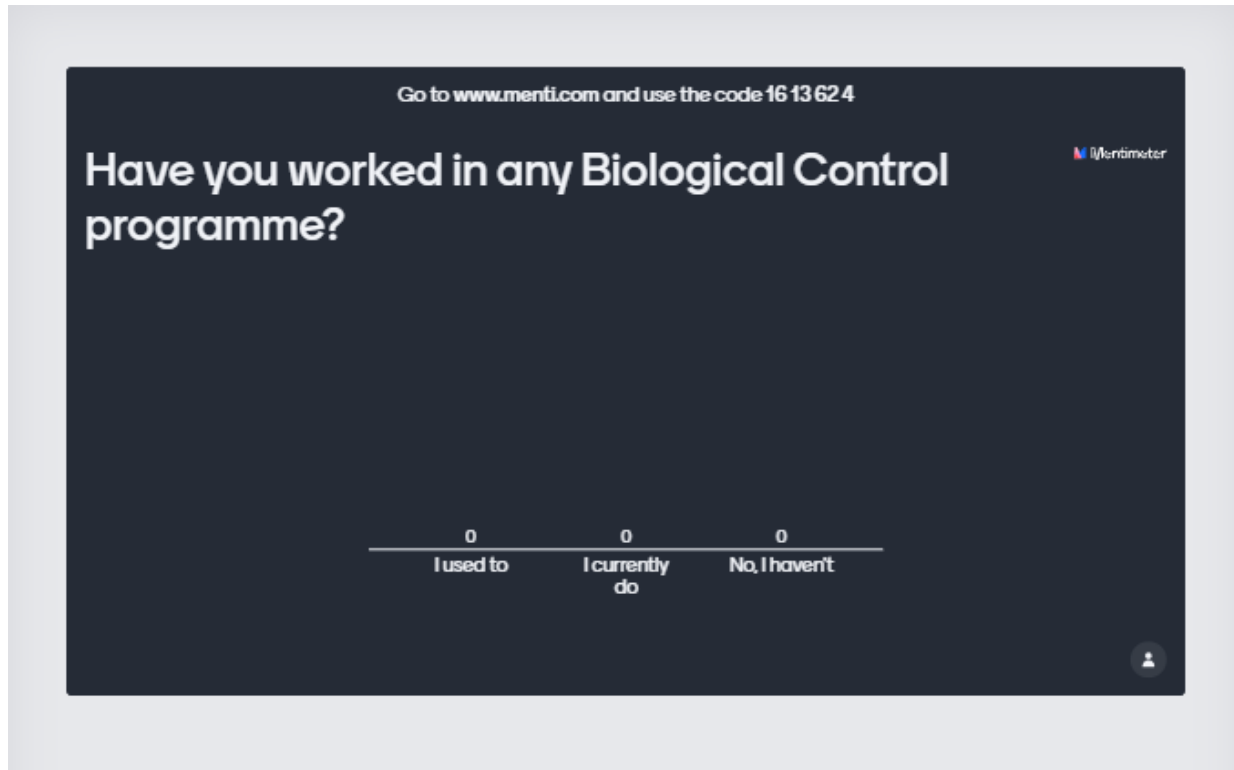


*Tamarixia radiata* (Hym: Eulophidae)

[Source: ucanr.edu](http://ucanr.edu)

# Discussions on Biological Control - Audience

- Take your phone and go to [www.menti.com](https://www.menti.com)
- Use the code: **16 13 624**





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شكرا جزىلا  
mercí शुक्रिया xie-xie obrigado  
merci zikomo efharistó  
ありがとう kiiitos **thank you** gracias zikomo  
danke urakoze tak ke iturnetse asante  
terima kasih dhanyawaad

Yelitza Colmenarez

[y.colmenarez@cabi.org](mailto:y.colmenarez@cabi.org)