

## Vitamin derivative for the control of the Huanglongbing psyllids vectors (HLB)

The Spanish Research Council (CSIC) has developed a compound for the biostimulation of the natural defense mechanisms of the plants. In particular, the compound has been particularly effective in controlling the insects of the *Trioza erytrae* and *Diaphorina citri*, vector of the bacterium (*Candidatus Liberibacter*) that causes the Huanglongbing disease (HLB), considered the most destructive disease that currently affects crops citrus worldwide. Partners are being sought to exploit the existing know-how.

### Huanglongbing, a global plague

Huanglongbing (HLB), also well-known as "Greening" of citrus fruits, was detected for the first time in 1919 in South China and is now known that it is present in about 40 different countries in Asia, Africa, Oceania and North America and South. The causative agents are bacteria of the genus *Candidatus Liberibacter*, restricted to the phloem. They are spread from tree to tree by the psyllid: *Diaphorina citri* in Asia and America, and *Africa Trioza erytrae*. Almost the all species and commercial cultivars of citrus are susceptible, regardless of the patterns.

The period of latency of the disease can last up to five years, making it difficult to detect. The infected trees suffer a delay in its growth and lose their characteristic green color while the fruits appear misshapen (asymmetrical). The control of this disease is complicated; the most effective method is the early detection of affected trees and their destruction, as well as the control of psyllas that serves as vector of the disease.



On the right one can see the nymphs that transmit the disease. To the left of the image, there is an adult psyllid.

### Innovative aspects and advantages

The invention is related to the use of compositions that mainly contain Menadiione (Vitamin K3 or pro-vitamin K) that applied to plants bio-stimulates their natural defense mechanisms in order to control in the treated citrus the psylla attacks from *Troza erytrae* and *Diaphorina citri*, vector of the *Liberibacter* bacteria causing Huanglongbing disease (HLB).

- Excessive use of pesticides entails a real danger to the soil and the environment, and to date has proven ineffective for the dispersal of the psyllid vector. However, the new compounds are characterized for being systemic, biodegradable, non pesticides, nontoxic and innocuous from the environmental point of view. They are not harmful to plants, animals or people.
- The recommended way to implement the different compositions is the pulverization of the aerial part of the plant, which does not exclude, for example, stem injection, direct application to soil or other growing medium of the plant, or indirectly through irrigation water, etc.
- Finally, the compound can be mixed with various additives such as: organic and inorganic fertilizers, insecticides, acaricides, nematocides, fungicides, bactericides, herbicides.

### A solution for the citrus industry

The HLB is a destructive disease that represents the greatest threat to the citrus worldwide industry. The disease has been detected in the majority of the largest producers such as Brazil, USA, China or South Africa, with significant losses. Only in the state of Florida, it has been reported losses of more than 3.6 billion dollars in five years.

The present invention represents a real solution to the major disease currently affecting citrus which is far from being controlled.

### Patent Status

Spanish patent priority with international extension via PCT.

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