Long-term Relationships between Entomopathogenic Fungi and Citrus Trees

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Summary: Huanglongbing (HLB) has been the curse of Florida citrus growers for the last two decades. Conventional insecticides are used to control the psyllids. An alternative strategy with many positive aspects is the use of entomopathogenic fungi (EPF). Endemic species of EPF (e.g., *Hirsutella citriformis* and *Isaria fumosorosea*) which are found in groves demonstrate high mortality against the insect vector of HLB. Species like *Beauveria bassiana* are not as readily abundant on citrus as those other EPF but may be applied to the leaves of citrus just the same by greenhouse managers or grove operators. This research is split between greenhouse studies and subsequent open field studies. The former seeks to determine how consistently *Beauveria bassiana* from two strains of EPF becomes endophytic in citrus tissues following a single foliar application. Tree physiological data are collected to provide evidence for any growth promotion EPF may be associated with. Endophytism in the leaves, stems, and roots of EPF-treated citrus is also being assessed. The field studies consider EPF effects under citrus greening pressure. This project is ongoing and aims to contribute a clearer understanding of long-term endopythic persistence of commercially available EPF and their role in protecting trees from HLB and their effects on plant growth in citrus trees.

Take Home Message:

- Entomopathogenic fungi like *Hirsutella citriformis* and *Beauveria bassiana* can rapidly infect and kill these vectors.
- Entomopathogenic fungi not only provide protection to the citrus trees but may even be able to strengthen the tree's growth by increasing its access to soil nutrients and upregulating certain hormones.
- Commercially available EPF may be able to persist as endophytes in citrus over a long time period under greenhouse and open-field conditions.

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