Combating Huanglongbing Through the Development of a Non-phytotoxic Oxytetracycline Formulation and Novel Fluorescence-Based Detection System

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Huanglongbing (HLB), more commonly known as citrus greening, is a devastating disease caused by bacteria that colonize tree phloem, restrict nutrient flow, and cause symptoms such as fruit drop and reduced fruit quality. In Florida alone, it has reduced the citrus industry's value from $9 billion to merely $3 billion in recent years. Foliar application of two EPA-approved antibiotics for combating citrus greening, Oxytetracycline (OTC) and Streptomycin (STM), have been used in field settings for several years with no significant success. The EPA recently approved OTC for trunk injection, the only treatment available to citrus growers in Florida. However, the OTC formulation causes trunk damage due to low pH and OTC phytotoxicity, and there is no current solution to this problem. Furthermore, there is a need for a detection system to monitor OTC levels in the plant to ensure the treatment is effective. This research focuses on the development of a Oxytetracycline (OTC) formulation using biocompatible inert materials including Ocimum sanctum phytochemicals that solubilizes OTC at a neutral pH to alleviate phytotoxicity. Additionally, a unique paper-based sensor has been developed that improves the inherent fluorescence property of OTC and can therefore be used to check OTC levels in leaf tissue.

Awards Won:
Fourth Award of $500