

Decoding HLB research: Using text mining to support grower decision-making

Ulianova Vidal-Gomez, Kaity Coleman, Sandra Olkowski, Neil McRoberts, David McClure, Uros Mojsilovic, Mike Hill, Dharmendra Kalauni, Sebastian Galindo, Lauren M. Diepenbrock, Tripti Vashisth, Yu Wang, and Megan M. Dewdney.

Huanglongbing (HLB) has severely impacted citrus production over the past decade, particularly in Florida, driving extensive research into its biology and control strategies. However, much of the resulting knowledge remains highly technical, fragmented, and largely inaccessible to the growers and stakeholders who need it for practical decision-making. To address this critical gap, we analyzed 269 HLB-related grants funded by the U.S. National Institute of Food and Agriculture (NIFA) to identify key research trends, knowledge gaps, and future directions. Using advanced text mining techniques, including word frequency analysis, tf-idf scoring, co-occurrence networks, and hierarchical clustering, we evaluated grant titles, summaries and reported outputs. Our analysis reveals a strong focus on long-term theoretical approaches, particularly in: 1. understanding host-pathogen interactions and 2. controlling the Asian Citrus Psyllid (ACP). In contrast, short-term practical solutions, such as antimicrobial treatments and nutritional programs, have received relatively little attention. These findings highlight an urgent need to rebalance research efforts towards actionable solutions and improved information dissemination. By guiding future research priorities and supporting the development of accessible web-based tools, this work aims to empower growers with clear, practical knowledge to combat HLB, ultimately, enhancing efforts to manage the disease.

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