

Making Research Work for Growers: AI and Text Mining to Bridge the Gap in Huanglongbing (HLB) Disease Management

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Huanglongbing (HLB) is the most devastating disease affecting citrus in the United States, with severe impacts in Florida and growing concern in Texas and California. In response, USDA has funded numerous research initiatives, generating a substantial body of literature on HLB biology and management. However, systematically identifying research trends and knowledge gaps across hundreds of documents is challenging, and translating that scientific knowledge into practical, accessible information for growers remains a critical unmet need. In this study, AI tools were used to organize and structure a corpus of approximately 700 USDA-funded HLB grant reports, and the content analyzed by text mining methods. This approach enabled the simultaneous computational analysis of hundreds of documents, identifying recurring topics, research priorities, and shifts in focus between initial grant proposals and final reported outputs. Management targeting the Asian citrus psyllid, dominated the research narrative, closely linked to breeding, host resistance, and molecular biology. Topics such as citrus nutrition and antimicrobial strategies appeared less frequently, suggesting underexplored areas with potential for rapid, field-level impact. These findings highlight how research priorities evolve over time and reveal knowledge gaps. This work represents a first step toward building smarter, evidence-based extension materials that consolidate decades of USDA-funded research into clear, actionable information, helping growers make informed decisions in the fight against HLB.

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