

FORWARDING DIAGNOSTICS AND MONITORING FOR THE OAK WILT PATHOGEN THROUGH DEVELOPMENT OF A LAMP ASSAY

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Oak wilt, caused by the fungal pathogen *Bretziella fagacearum*, is a destructive vascular disease of several oak species in the United States. Throughout the past decade, increased incidence and intensity of oak wilt outbreaks has been observed across the United States. Regular surveillance and detection of the oak wilt pathogen is essential in preventing and controlling outbreaks; however, there is currently a lack of rapid diagnostic methods for oak wilt. Symptoms of oak wilt are often hard to distinguish from other causes, and current conventional molecular methods of detection are unreliable and reliant on pathogen isolation. We propose an approach to oak wilt diagnostics using LAMP (loop-mediated isothermal amplification), which would resolve several of the current obstacles in oak wilt detection. LAMP can be performed in the field, does not require expensive laboratory equipment, and is faster than conventional polymerase chain reaction (PCR). Our assay can detect *B. fagacearum* in as fast as 11 minutes from multiple types of field samples with a sensitivity of as low as 1 pg of DNA. Additionally, the assay is highly specific, overcoming some of the cross-reaction issues associated with the nested PCR protocol. Finally, because it does not react with uninfected oak DNA, the assay can be used directly on the host plant tissues, without the need for prior pathogen isolation. We hope this assay will serve as a rapid, accurate, and accessible diagnostic tool to assist in managing and preventing oak wilt.

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