

Isothermal Amplification assay for detecting *Phytophthora infestans*

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Phytophthora infestans is the most economically devastating pathogen of potato, with losses of more than five billion dollars annually. A rapid and sensitive in-field diagnostic technique would be valuable to detect the pathogen and help improve disease management, benefiting growers, consumers, and food security on a global scale. We developed a loop mediated isothermal amplification (LAMP) procedure that detects late blight based on amplification of *P. infestans* DNA. LAMP has advantages over traditional nucleic acid based detection techniques such as PCR including enhanced specificity, decreased amplification time, and elimination of the need for expensive and bulky thermocycling equipment. This method, paired with rapid DNA extraction, could detect *P. infestans* using only a heated block and an intercalating dye, SYBR green. This allows for visual detection of an amplicon under normal light in one hour. Seven other closely related *Phytophthora* species that also infect potato or tomato including *P. cactorum*, *P. capsici*, *P. cinnamomi*, *P. cryptogea*, *P. drechsleri*, *P. erythroseptica*, and *P. nicotianae* are being tested for specificity of the assay. This technology could benefit growers by detecting the disease rapidly and accurately without laboratory specialists and expensive equipment and could improve management practices by preventing the spread of infected seed tubers, and reducing fungicide use.

