

Rapid diagnostic and detection strategies for management of tomato late blight

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Late blight, caused by the oomycete *Phytophthora infestans*, is a recurring disease that threatens tomato and potato crops. *P. infestans* was responsible for the Irish Potato Famine and continues to devastate potato and tomato crops on a large scale. This provides a strong impetus for the development of reliable and effective management strategies. A need exists for detection and diagnostic tools that can be used in the field. Loop-mediated isothermal amplification (LAMP) with hydroxynaphthol blue dye has the potential to be a diagnostic tool for *P. infestans* because it is rapid, does not require a thermocycler, and results can be observed visually. A series of LAMP assays were conducted to test the feasibility of using LAMP for *P. infestans* diagnostics. The limit of detection of *P. infestans* was found to be 0.1 pg/ μ L when using DNA isolated from pure cultures. *P. infestans* was also detected in DNA extracted from late blight lesions on tomato leaves. The LAMP assay demonstrated a high level of specificity when conducted with other oomycetes, as well as unrelated fungi and bacteria. However, these primers could not differentiate *P. infestans* from high concentrations of *P. nicotianae* DNA. The ongoing project of using roto-rod spore traps to detect *P. infestans* sporangia in air samples continued. All quantitative PCR results from spore trap samples collected from March to July 2014 were negative. This was in line with the late blight occurrence map. LAMP and the use of spore traps prove to be promising tools for the diagnosis and detection of late blight and *P. infestans* in the field.

