ABSTRACT

Bacterial wilt caused by *Ralstonia solanacearum* is considered among the most damaging diseases of potato in Sub-Saharan Africa and the most significant biotic constraint of potato production alongside late blight. Unlike late blight, which can be managed by chemical means, *R. solanacearum* can only be managed through cultural methods and clean seed. Laboratory testing to certify seed before planting is required to confirm the absence of the pathogen in Kenya. A loop-mediated isothermal amplification (LAMP) assay was developed using the UDP-(3-*O*-acyl)-*N*-acetylglucosamine deacetylase gene (*IpxC*) to screen seed potato for *R. solanacearum* strains. The assay was assessed using DNA extracted from *R. solanacearum* and other soil and potato pathogens to demonstrate specificity and sensitivity. The LAMP assay was validated using field samples from different potato growing regions of Kenya collected over two growing seasons and compared with established nucleic acid and protein-based assays. The *IpxC* LAMP assay was found to be specific and sensitive to *R. solanacearum*, detecting as low as 2.5 pg/µl of *R. solanacearum* DNA. Of the 47 potentially infected field samples collected, both *IpxC* LAMP and quantitative polymerase chain reaction (PCR) detected *R. solanacearum* DNA in 90% of the samples, followed by conventional PCR (86%) and ELISA (75%). This *IpxC* LAMP assay is a promising diagnostic tool to rapidly screen for *R. solanacearum* in seed potato with high sensitivity in Kenya.