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## VISUAL INSPECTION TO MANAGE BACTERIAL WILT IN SUB-SAHARAN AFRICA: IMPROVING SEED QUALITY AND IMPACTING SMALLHOLDER FARMERS

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Potato is a key cash and food security crop for mid to highland farmers in Sub-Saharan Africa (SSA). Bacterial wilt caused by *Ralstonia solanacearum*, is one of the most devastating diseases affecting potato in SSA. This soil borne disease spreads largely through infected seed tubers, and has come to infect most potato growing regions in SSA. Irrigation and water run-off down the slopes of potato farms and into waterways, and tools carrying infected soil are other important transmission methods. In a survey conducted in 11 potato growing regions in Kenya over two growing seasons, bacterial wilt was observed on 63% of 145 sampled farms, and disease incidence ranged from 1 to 50%, with a mean of 11% per farm. Another survey conducted in nine divisions within Nakuru county of Kenya, found that the prevalence of bacterial wilt ranged from 36 to 100% of the total 147 sampled farms, and on-farm disease incidence ranged from 0 to 42% (Mwaniki, personal communication). Resistance has eluded breeders, hence, management strategies to reduce the spread and incidence of bacterial wilt rely on using clean seed and good agricultural practices (GAP). While, certification regulations exist in several SSA countries to prevent bacterial wilt infected seed from entering the seed system, they are officially practiced only in Kenya. While certified seed is available in Kenya, quantities of certified seed supply approximately 2% of demand and are available at a few locations across the country, making accessibility and disease spread through the informal seed system a concern. Quality declared planting material (QDPM) is an alternative approach to assess the health status of seed that is based on visual inspection to remove infected plants from seed multiplication plots and GAP, particularly crop rotation, alternative host management and field hygiene. QDPM is promoted for practice among decentralised seed producers who further multiply certified seed in close proximity to farmers, particularly smallholder farmers, thereby increasing geographic and economic accessibility to quality seed. Positively selected seed is another seed source for smallholder farmers. Positive selection is a visual form of seed selection based on saving tubers from the healthiest plants in a crop for the following season's seed. Incidence of bacterial wilt in 25 farmers' fields planting positively selected seed averaged 5%, while 25% incidence was observed in plants obtained from randomly selected seed, known as farmer-saved seed. In another study, positive selection reduced incidence of bacterial wilt compared to farmer-saved seed from 41 to 13% (Kakuhenzire et al., 2013). Of the 100% of plants that were infected with *R. solanacearum* in the highly susceptible cultivar Revolución, 13% were latently infected and would by-pass visual inspection. Despite some drawbacks from latent infection reducing the ability to remove bacterial wilt infected tubers from seed sources, data support that seed originating from visually inspected plants reduces bacterial wilt incidence and improves yields compared to farmer-saved seed. Considering the widespread distribution of bacterial wilt in SSA, integrating visual inspection and GAP is a feasible option to produce quality seed, and support QDPM as a viable option for a quality control system for seed potato to increase smallholder farmer accessibility to clean seed.