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“Bridging the gap between increasing knowledge and decreasing resources”

Improving Seed Potato Quality in Southwestern Uganda for Strengthening Food and Cash Security

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Abstract

Uganda is highly vulnerable to poverty, and further investment in agriculture is crucial for sustainable, long-term food security, and rural development. Potato (*Solanum tuberosum*) is an important crop for poverty reduction in the rural environment of southwestern Uganda because it is both a source of food and a source of income. The national mean potato yield is about 7 t ha⁻¹, which is low compared to a potential yield of 25 t ha⁻¹. The major yield constraining factor is the overall poor seed potato quality. The majority of smallholder farmers use seed from the informal sector, in which seed-borne virus diseases accumulate over time. Lack of disease-free seed tubers and of commercially traded high quality seed tubers are main impediments for small-scale farmers. This research aims at improving agricultural productivity in southwestern Uganda by evaluating and understanding improved seed potato production technologies and their opportunities at local scale. The project will focus on testing and adoption of the method positive seed selection to maintain and improve seed quality. Positive selection, pegging healthy looking plants during flowering to potentially serve as seed for the next season, is a tool to create alternative seed multiplication and develop knowledge on how to sustainably improve the quality of seed potatoes and therefore food and cash security for small-scale farmers in southwestern Uganda. Positive selection can lead to yield increases after one season and is easily adoptable by seed producers, but is not tested across multiple seasons; moreover, the mechanisms behind it and virus incidence are not fully understood. On-farm field trials over several generations will provide a proof of concept and further insight in why positive selection causes regeneration of the seed potato stock. A sociological study among small-scale farmers will provide more insight into farmers' livelihoods and opportunities and bottlenecks of different seed technologies, and will investigate adoption of seed technologies and perspectives of the availability of high-quality potato seed tubers in southwestern Uganda. An economic analysis will assess and evaluate costs and benefits of the different technologies to develop recommendations with respect to affordability and feasibility for smallholder farmers.

Keywords: Positive selection, potato, seed potato systems, Uganda, viruses