SASHA
Sweetpotato Action for Security and Health in Africa

Financial Feasibility of Sweetpotato Vine Multiplication in Uganda and Tanzania and Implications for Going-to-scale

AUG 2018

The development of an economically feasible and sustainable vine multiplication models and vine distribution channels is critical for obtaining high sweetpotato yields. A study was done in Uganda and Tanzania in early 2018 to identify, one, which of the vine multiplication models in use is the most financially viable; and two, determine the number of vine multipliers needed to adequately supply clean sweetpotato vine in the two countries. Results show that at vine multiplier level, it is more financially feasible to multiply vines without using protected structures that guard against virus infection. Rapid multiplication is also more profitable than conventional vine multiplication. Generally, multiplication of vines in the low virus pressure areas is more profitable than in the high virus pressure areas. To supply enough quality vines to root producers in the two countries, 115 vine multipliers need to be established in Uganda and 184 vine multipliers in Tanzania, each with at least 0.4 ha under rapid vine multiplication.

CIP
INTERNATIONAL POTATO CENTER
A CGIAR RESEARCH CENTER

CGIAR RESEARCH PROGRAM ON Roots, Tubers and Bananas

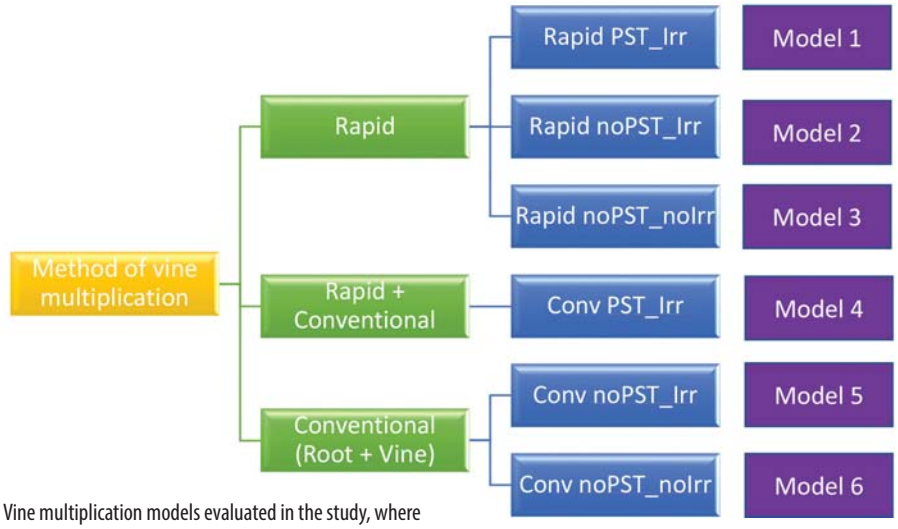

Fig. 1 Vine multiplication models evaluated in the study, where PST is a protected structure, Irr is irrigated, noIrr is no-irrigation, Conv is Conventional multiplication.

What did we want to achieve?

In addition to identifying financially viable vine multiplication models for adoption; and determining the number of vine multipliers needed in Uganda and Tanzania, the study also sought to characterize vine multipliers by type and determine the transaction costs in vine multiplication. Figure 1 shows the different vine multiplication models that were evaluated.

Where and with whom did we work?

The study was done among the vine multipliers that operated in different sweet potato virus disease (SPVD) pressure areas and in different agro-ecological zones. In Uganda, the multipliers were selected in Northern and Eastern Uganda (Low SPVD areas) and Central and Western Uganda (High SPVD areas). In Tanzania, the study was done in Mwanza and Geita regions (High SPVD areas) and in Morogoro, Mbeya, Iringa and Shinyanga (Low SPVD areas). In addition, 12 key informant interviews were conducted among government extension agents, managers of pre-basic sweetpotato seed enterprises and technical staff in research institutions.

How did we make it happen?

We used case study methods to differentiate multiplication approaches in the different SPVD

pressure and agro-ecological zones. We used the transaction cost economics approach to assess the non-price constraints in the multiplication of vines and cost-benefit analysis to assess which models are financially feasible and thus, can be adopted for scaling up. We used the national sweetpotato production data for Uganda and Tanzania, findings from the first stage of this study, and assumptions based on an in-depth literature review and field experience to determine the number of vine multipliers (VMs) that need to be established in the two countries.

What did we learn?

There are various channels used in vine multiplication and dissemination. Figure 2 shows five channels by which the pre-basic vines reach the root producers. In both countries, some VMs have adopted the root-based Triple S method as a form of vine multiplication.

We learnt that vine multiplication is constrained by high transaction costs. Specifically, limited access to net material and lack of experience in use of protected structures, limited market for vines, and drought are key sources of the transaction costs. Costs are higher when multipliers multiply and conserve vines in small protected structures (Fig. 3) than in large protected structures. Multipliers in high SPVD areas face more transaction costs than those in low SPVD areas.

Multipliers used both the rapid and conventional methods of vine multiplication. The study found that in the most common state of vine multiplication encountered in the field, vine multiplication is financially feasible but the method of production compromises the quality of vines. Production of vines following the recommended agronomic practices (hypothetical state) revealed that rapid vine multiplication was financially feasible, but the conventional vine multiplication was not. The study found that multiplication of vines without using protected structures is more financially sound than when vine multipliers utilize the protected structure. Generally, multiplication of

Fig 3 a. Small protected structure (net tunnel), b. Big protected structure (mini-screenhouse). Vine multipliers with small protected structures experienced higher transaction costs

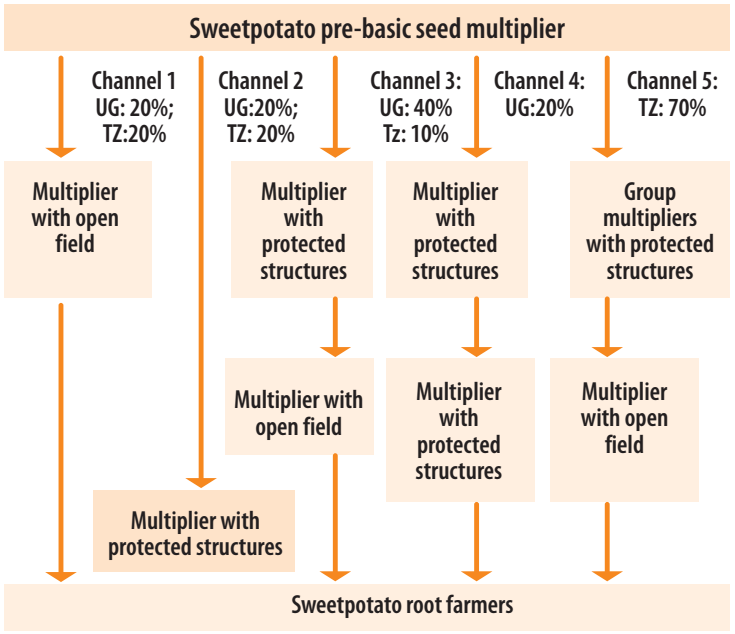

Fig. 2 Different vine multiplication channels in Uganda and Tanzania

vines in low SPVD areas is more profitable than in the high SPVD areas. This is driven by demand being higher in the low SPVD areas due to frequent drought compared to the high SPVD areas, which are associated with bimodal sweetpotato production.

Scenarios developed based on the most financially feasible method of vine multiplication (rapid multiplication with protected structures) indicate that: 1) a bag of vines (with 1,000 cuttings) should not be sold at less than USD 3.5; 2) at least 2,000 bags of vines per hectare (2,000,000 vines) should be sold and 3) conventional vine multiplication is profitable if vine multipliers sell from the smaller conservation plots (under rapid multiplication) and the conventional plots.

The study recommends rapid vine multiplication to assure quality and profitability. Conventional vine multiplication in practice leads to over-harvesting of vines, eventually leading to poor quality roots. The study recommends establishment of 115 vine multipliers in Uganda and 184 Vine multipliers in Tanzania, each with at least 0.4 ha committed for rapid vine multiplication each year to ensure adequate supply of vines to root producers in the two countries. The study also recommends incentives to support establishment of protected structures across the two countries particularly in high SPVD areas, to avoid risks of complete loss of vines because of SPVD or dry spells. The proposed maximum distance between protected structures managed by the vine multipliers in sweetpotato growing regions should be around 200 km in low SPVD areas and 100 km in high SPVD areas.

CONTACT
Norman Kwikiriza (CIP)
n.kwikiriza@cgiar.org