Triple S Storage in Sand and Sprouting – testing a scaling strategy in Western Kenya

AUG 2017

The validation of the Triple S is nearing completion in western Kenya. Trials show that medium–sized roots stored in coarse sand for seven months produce viable planting material. There is a higher establishment rate and vigor in plots planted with vines sourced from Triple S beds compared to farmer selected material. A scaling strategy is being tested with 400 households, to identify the drivers which contribute to the uptake of the technology.

Fig. 1 Medium-sized roots stored in coarse sand for seven months in upper Gem cluster, Siaya County. (credit S. Agili)

What is the problem?

A common practice for farmers living in areas with long dry seasons is to obtain sweetpotato planting material from roots, overlooked during harvest, which then sprout when it rains. This has challenges because it delays planting and planting material is of low quality because of virus accumulation and weevil infestation, with subsequent low root yields. Using the Triple S technology, farmers store small but healthy roots in sand during the dry season. Then 6-8 weeks before the rains start, the sprouted roots are planted in a seed bed and watered, assuring adequate planting material at the start of the rains. CIP and its partners have shown that Triple S works in Tanzania and Uganda where the dry season is three to four months. The Triple S technology also needs to be validated in western Kenya which accounts for over 70% of the country's production area for sweetpotato (47,411 hectares), and where in some parts, the dry season can last up to seven months.

What do we want to achieve?

We want to test and adapt the Triple S technology to the agro-climatic and socio-economic conditions in Kenya, and test a scaling out strategy to reach 800 households by 2020.

Where and with whom are we working?

We started by mapping out the hot dry areas in Siaya, Homa Bay and Migori counties where this technology could be validated. Eight sub-counties were identified and the agricultural officers for these areas invited to participate in the validation process.

How are we making it happen?

Lead farmers and agricultural extension staff participated in a one day training of trainer's (ToT) workshop. This training covered: positive selection of roots for storage in sand and sprouting and multiplication of sweetpotato planting material using the Triple S technology. Participants identified target areas in their sub-counties and prepared seasonal calendars showing the dry season and when each step in Triple S should be implemented. Upon their return home, the participants each recruited ten farmers to train and mentor.

What have we achieved so far?

Forty ToTs (35% female) from the three counties were recruited and trained on the Triple S technology. In turn, they have trained 400 farmers (70% female) who are involved in the participatory validation of the technology. Three

Partners:

- Ministry of Agriculture in Migori, Homa Bay and Siaya Counties

Fig. 2 Sprouted beds in Rarieda B Cluster, Siaya county. (credit S. Agili)

Fig. 3 Planting of sprouted roots in open field beds North Kadem cluster Migori County (credit S. Agili)

sequential trials have been established across nine sites. Twelve feedback meetings and follow up visits have been made to each sub-county to monitor and mentor farmers through each step in the Triple S.

The first trial on the selection of roots and storage in containers of sand (Fig. 1) for seven months is completed. Twelve treatments included: local variety vs introduced variety; coarse sand vs fine sand; and comparison of small, medium and large sizes of roots. Preliminary results show that the highest rate of sprouting was on roots stored in the top layer of sand regardless of the treatment; there was a higher number of rotten roots in basins with fine sand regardless of the treatment; and large roots had the highest number of sprouts regardless of variety or the type of sand used. The least rotting and sprouting of storage roots were observed in basins stored with medium–sized roots covered with coarse sand.

During storage, roots were de-sprouted once, after three months. After seven months of storage, the roots were removed from the basins, healthy roots of each size (small, medium and large) were selected and planted out in seed root beds measuring 1.2m x 20m, at a spacing of 0.6m x 0.6m giving a total of 66 roots per bed. A total of 86 beds were established across the nine trial sites (Fig. 2). This second trial aimed to monitor the rate and quality of vine production in the beds. After two months, three sample plots for each variety were mapped out, the vines harvested and weighed. Vine yield from the first harvest across the sites for the two varieties ranged from 8-29 kg. This wide range could be attributed to low vine yield in some sites that had experienced a prolonged dry spell and lack of adequate water for irrigation. Second and third cuts willl be done on the same plots at intervals of two months, with the aim of determining the threshold of vine yields from the root beds before vine yield declines.

A third trial (Randomized Complete Block Design with three replications) has been established to estimate storage root yield. The treatments compare the performance of planting material sourced from the sprouted beds (Fig. 3) to that sourced from the open field, that is the current farmer practice. Data have been collected on establishment, vigor, virus incidence across the nine trial sites. Preliminary observation indicates a higher rate of establishment and vigor for plots planted with planting material sourced from the seed root beds regardless of the variety. High virus incidence was observed in plots planted with materials sourced from the open field.

What's next?

The data collection and analysis for the second and third cuts for the second trial; and estimates of storage root yield from the third trial will be completed.

Results will be shared with the farmer groups, with a reflection on the lessons from the validation process and scaling strategy. The gender balance among agricultural extension officers is skewed. Therefore, the implications of the Triple S technology will be assessed, including the need to include more women lead farmers as ToTs.

Advocacy and ToT materials will be discussed with County Department of Agriculture officials and sub-county and ward agriculture extension officers to promote further scaling of Triple S, and institutionalization into Department of Agriculture work plans.

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