SPHI Seed System Community of Practice

**Summary of Discussion Topic**

**Title: TOPIC 9-Technical description of sweetpotato seed classes**

## 1. Summary of participation statistics

Table 1 shows the summary of participation statistics under this topic.

| Duration | Lead discussant; institution & country | No. of contributions | No. of unique respondents | No. & type of institutions | No. of countries |
|---|---|---|---|---|---|
| 21 days 8th Feb- 28th Feb 2016 | Mihiretu Cherinet; CIP- Ethiopia | 20 | 10 (8 Male, 2 Female) | NARI (2), CIP (5), Private sector (1), University (2) | 9 |

## 2. Introduction

In this topic, members are asked to share their ideas, especially understanding of technical description of the sweetpotato seed classes and experiences on this from their work. As the seed system is progressing towards commercialization with countries coming up with definitions of the different generations of seed and quality standards, it is important for scientists to have clarity on the technical definitions and terminologies. The moderator notes that despite differences across countries, they could establish common scientific explanation for the different generations of sweetpotato seed. Issues for discussion include: meaning of breeder, pre-basic, basic and other seed classes; whether breeder seed that has been maintained in field conditions for a long period (e.g. 10 years) can still be the original material? Since breeder seed is the source of all the subsequent classes of seed, it is important to set standards for its maintenance, multiplication, originality test and other variables. Need to have science-based way of setting production standards, e.g. for setting the optimum number of generations before it goes to root producers, issues on physiological vigor (whether it matters and how to track it through generations of multiplications). The topic attracted 20 contributions, from 10 respondents, majority being CIP scientists. The lead discussant was Mihiretu Cherinet from CIP Ethiopia. This summary highlights the key points, areas of consensus, disagreement, and ideas suggested that members could consider to try in their work to further learning and inform development /practice in sweetpotato seed system.

## 3. Key points and areas of consensus/disagreement.

The discussion drew considerably from experiences in Malawi and to some extent Nigeria. It was informed by finding from a study on generation and maintenance of foundation seed conducted several years back, which at the time relied on visual, molecular methods and molecular analysis for trueness to type and disease-free. Evidence from the study together with other accumulation of evidence that virus infection contributes to cultivar decline, led to a shift from visual selection of off-types, to maintenance of virus tested mother plants in tissue culture and nodal plants propagation to increase plants for field multiplication. Along with this information from the past study, it was noted that in recent times, priority seems to be on virus-testing over true-to-type testing, and that very little work takes place to follow up on genetic purity of varieties maintained in tissue culture, either through molecular means or phenotyping. The rate of genetic/physiological degeneration from generation to generation is given little attention in SSA countries seed system. One of the reasons could be lack of sufficient information about it. For that matter, sweetpotato scientists are also indifferent on generation effect on quality. Experience from USA indicated that degeneration of variety "Jewel" in the foundation seed occurred after maintaining it for many generations. Although it is not scientifically proven, another experience showed that smallholder farmers could keep the genetic purity for 16

years. The discussion indicated that current knowledge on the effect of generation in a given seed class is not clear neither is there a clear generation number distinction between seed classes. Moreover, multiplication protocol of a given seed class varies across countries (some countries maintain breeder seed in screenhouse, others in TC lab).

The following are key points that can be drawn from a country experience (Malawi):

- Only a very small percent (5%) of the planting material comes from the formal sector (commercial multipliers, DVMs and NGO supported CBOs & farmer groups), but even with support from CIP and other agencies, few of the multipliers meet the minimum standards.
- With such small proportion of planting material coming from formal sector (with the rest from farmer owned and informal system), a need to strike a balance between formal and farmer is suggested coupled with articulating a strategy for supporting farmers as both customers and managers.
- There seemed to be an agreement that constant injection of clean material can have a positive effect, though it depends on whether farmers decide to adopt them and also how they manage the varieties (e.g. if degeneration occurs, there could be regeneration or farmers could abandon the variety). To add with an illustration on the possibility of degeneration and regeneration (or variety performance & farmer management), it was noted that a variety called Kenya (white-fleshed) is still dominant across the country 16 years after introduction (and without systemic injection), while another (SEMUSA) that was widely grown ten years back, seems to have disappeared
- With some uncertainty about how the new (5) varieties introduced in Malawi will fare over time, there is a need to deepen the understanding of how farmers manage their planting materials of their own and of the new OFSP varieties and determine if there are simple ways to support them.
- Another point shared from literature relates to drivers of the formal seed sector- A development driver, in which the seed is seen as the vehicle to get farmers to access new varieties, which they can then manage (no need for injection of new seed from formal sector). An enterprise driver, where seed is viewed as a profitable product that can be sold to farmers-this is where they continue to buy the seed for quality reasons. Perhaps the question is for members to ask which are the development/variety and enterprise/quality (e.g. QDPM) drivers in their countries and whether they are explicit or implicit.

Key points from the shared experiences from Nigeria:

- Nigeria recognizes four classes of seed - (1) breeder seed - which maintains genetic purity, (2) foundation seed I - (progeny of breeder seed), (3) foundation seed II - (produced from foundation seed I), which cannot be used for production of other foundation seed, (4) certified seed (progeny of foundation seed or certified seed).
- To maintain the originalities of breeder seed, it should be in confined environment (TC lab or screen-house) with periodic bringing of new genotypes for replacement plus cleaning up.
- Like other African countries, the informal system dominates in Nigeria but efforts underway to domesticate FAO standards.
- Vigor is as desirable attribute for yield and is maintained through positive selection of mother plants.
- No specific optimum number of ratoons in the field, but depends on farmers' intended purpose (for root or vine or dual purpose- in which case number will tilt towards area of most need), the technology (e.g. if net tunnel, might go to 10 generations) and nutrient status of the medium

**4. Status on suggested follow up actions on emerged ideas/ techniques (to updated at CoP meeting)**

Table 2: status of suggested follow up actions on ideas or techniques

| Suggested idea for action | Follow up action taken | Where (country) & institution | Feedback to CoP |
|---|---|---|---|
| Systematic study to follow up/verify trueness of varieties maintained in TC, field multiplication for many generations (through molecular or growing plants in pots) to get science-based evidence of any changes | | | |

| | | | |
|---|---|---|---|
| Study to determine benefits of "injections" of healthy planting material (pathogen –tested and +/- selected) site and variety specific | | | |
| Determine physiological vigor indicators for sweetpotato seed and study different environmental/ production conditions that deteriorate physiological vigor. | | | |