SPHI Seed System Community of Practice

Summary of Discussion Topic

Title: Topic 5-Net tunnel technology

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
16 days 2nd -17th July 2015	Kwame Ogero, CIP-Tanzania	22	9 (7male, 2 female)	NARI (2) CIP (6) ARI (1)	7

2. Introduction

This topic was on net tunnel technology, a structure used to protect planting material from attack by virus vectors and pests such as whiteflies and aphids. The lead discussant posted 15 questions covering various aspects on its utilization to stimulate the discussion. As is often the case, another question was added into the discussion where a member sought to know from peoples' experience the number of generations/cycles material from a net tunnel would go through once planted in open field before the benefit of having come from a protected environment was seen. The topic ran for 16 days and realized 22 contributions from 9 respondents, as in Table 1. This summary highlights key points that emerged including any areas where there was consensus, disagreement, insights, learning points and any follow-up actions suggested or taken to further learning and development of practice.

3. Key points and areas of consensus/disagreement.

The issue of number of cycles that planting materials from a net tunnel can go through in open field before the advantage is lost, alone generated a lot of repeat contributions with interesting perspectives. For example, it was noted that whereas the farmer who buys the planting material from a net tunnel would want it to outperform his other material for as many generations as possible for it to be worth the investment, the net tunnel enterprise owner would want it to collapse after a few cycles but with significant increased performance to cause frequent farmer repeat purchases. None of the contributors could give a definite answer in terms of the number of generations it can be grown in open field before any benefit was lost. Rather, a variety of ideas and deductions were made. Some degree of consensus seems to exist (no disagreement) on the following:

- The number of generations depends on how the material is managed in the open field situation. Management is mostly about adherence to good agronomic practices particularly marinating isolation distances, which might not be feasible under farmer- managed conditions. The lead discussant shared from his running trial on this (under research management) looking at virus degeneration, which showed no virus symptoms after five generations for both net tunnel and open field materials.
- Sustainability of the net tunnel enterprise is contingent on there being a market for its material, the hypothesis being that if the material from net tunnel shows significant increase in performance and that farmers who buy it obtain a sufficiently solid return to induce frequent repeat purchases.

- Market for the net tunnel material/vines can be realized: (a) if the price for the vines is sufficiently low and the yield benefit was significantly high enough that farmers can go for repeat purchase much frequently, (b) in situations where there is existence of strong demand of say OFSP (it was shared that this seems to be happening in Rwanda such that there is demand for vines in most places).

Another perspective that attempted to compare sweetpotato seed systems with those for cereals and legumes was shared. In this illustration, use of a net tunnel to produce planting material of a high yielding, but virus susceptible, sweetpotato variety can be compared to hybrid maize seed. Therefore, it pays to buy the material every season. Whereas, a variety such as New Dimbuka (grown in Uganda), which can perform well when not clean can be viewed as comparable to grain legumes or open pollinated variety (OPV) maize, and therefore farmers can manage their own planting material or buy from informal market. There was some doubt that a dichotomous system such as the one for maize could be applicable/desirable in sweetpotato seed systems. Emphasis on cleaning susceptible varieties (and less on breeding for resistance) to achieve higher production might lock out smallholders. However, this concern/ doubt was checked by the thesis (largely agreed) that a good seed system should use a diversity of approaches and be able to cater for different market segments.

On the posted discussion questions, the following key points emerged:

- Consensus that mixing two varieties in a net tunnel is not advisable, because of various challenges related to likely differences in the way the varieties grow, and complication at harvest.
- The rotting of plants at the center was said to be due to thick foliage. The solution is to reduce plant density. All agreed that the gap at the center could be filled with sprouts from surviving plants.
- Caterpillar infestation after harvest was probably due to doors not closed properly or rusty binding wires, which create holes. Not all were for use of spraying as a control. Alternative ways for closing doors suggested include manila twines and smaller sized binding wires. Velcro was mentioned, but might not be locally available.
- Irrigation regimes are weather and soil dependent, vary as the crop grows; Kraal manure carries weed seeds and removal of all weeds after harvest helps especially in controlling late maturing weeds.
- If well-managed, net tunnel can remain effective for many years, though exact number of years still under investigation. A member promised to share findings from on-going research in Tanzania on virus degeneration when completed, which could shed light on this.
- No exact number of times a multiplier can harvest from net tunnel crop has been determined but expected to vary with variety and management.
- There was consensus that having more than one variety in a net tunnel should not be practiced.
- The recommended standard size for net tunnel for multipliers is 1.8m*3m*1.4m. The cost of construction varies with country but it is within the range of US $ 58 – 65. Adoption of the net technology will also be influenced by local availability of the insect proof nets. At the moment, the net (OPTINET 50) sourced from Nairobi, Kenya, is expensive and takes time to deliver. Identifying local suppliers in the different countries is essential. Contributors agreed that market for clean planting material has been improving due to introduction of new varieties (especially OFSP), demand for roots and in areas with high SPVD pressure.
- Interesting innovations that farmers have been seen to use in net tunnels: booster fertilizer instead of NPK, the way they repair net tunnels when there is a cut and using insect traps in mini screen houses.
- Issues thought to be still outstanding and needing research to resolve were around the probable cause of caterpillar infestation after harvesting and how to address it:
    - What is the most appropriate technology for weed control in the net tunnels, and yield assessment (roots/ vines) for net tunnel vs non-net tunnel planting material.
    - The effect of net tunnel size, spacing and fertiliser regime on the number of clean cuttings harvested.
    - Should cuttings be replanted each cycle vs. leaving rootstocks to re-sprout?
    - For how many generations can sweetpotato be grown outside before any benefit of growing

in a protected environment is lost?

4. **Status on suggested follow up actions on emerged ideas or techniques (to update 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
Plastic mulch for weed control?			
Number of times farmer harvest from net tunnels			