

Validating use of affordable net tunnels for prolonged maintenance of virus clean planting material in Ethiopia

Mihiretu, C.H.¹, McEwan, M.A.², Geberehiwot, T. ¹

Introduction

The use of insect proof netting to protect sweetpotato plants from attack by insect pests has been proven to lower the spread of Sweet potato virus disease (SPVD). Research institutes use large net tunnels for production of clean pre-basic seed but there are much smaller net tunnels designed for small scale farmer multipliers. Research on-station under research managed conditions showed that clean planting material planted inside the net tunnel stayed for 33 months without reinfection. Therefore, in this study we are validating the efficiency of net tunnels in prolonged maintenance of virus clean planting material for small scale farmer multipliers in Ethiopia.

Objectives

- To study quality degeneration of virus free planting material multiplied inside net tunnels compared to that multiplied in the open field.
- To evaluate acceptance of net tunnel technology among decentralized vine multipliers (DVMs)

Methods

Pathogen tested material of two sweetpotato varieties “Hawassa 83 & Kulfo” were planted in net tunnels and open beds measuring 3m by 1.8 m. 135 plants were planted in each bed with a spacing of 20cm x 20cm. To determine progressive quality degeneration, data on vine yields and environmental virus pressure (virus build-up and presence of insect pests) are being recorded.

Results and discussion

Growth performance

Plants grown inside net tunnel showed high vigor as compared to the ones grown outside for both varieties (Figure 1).

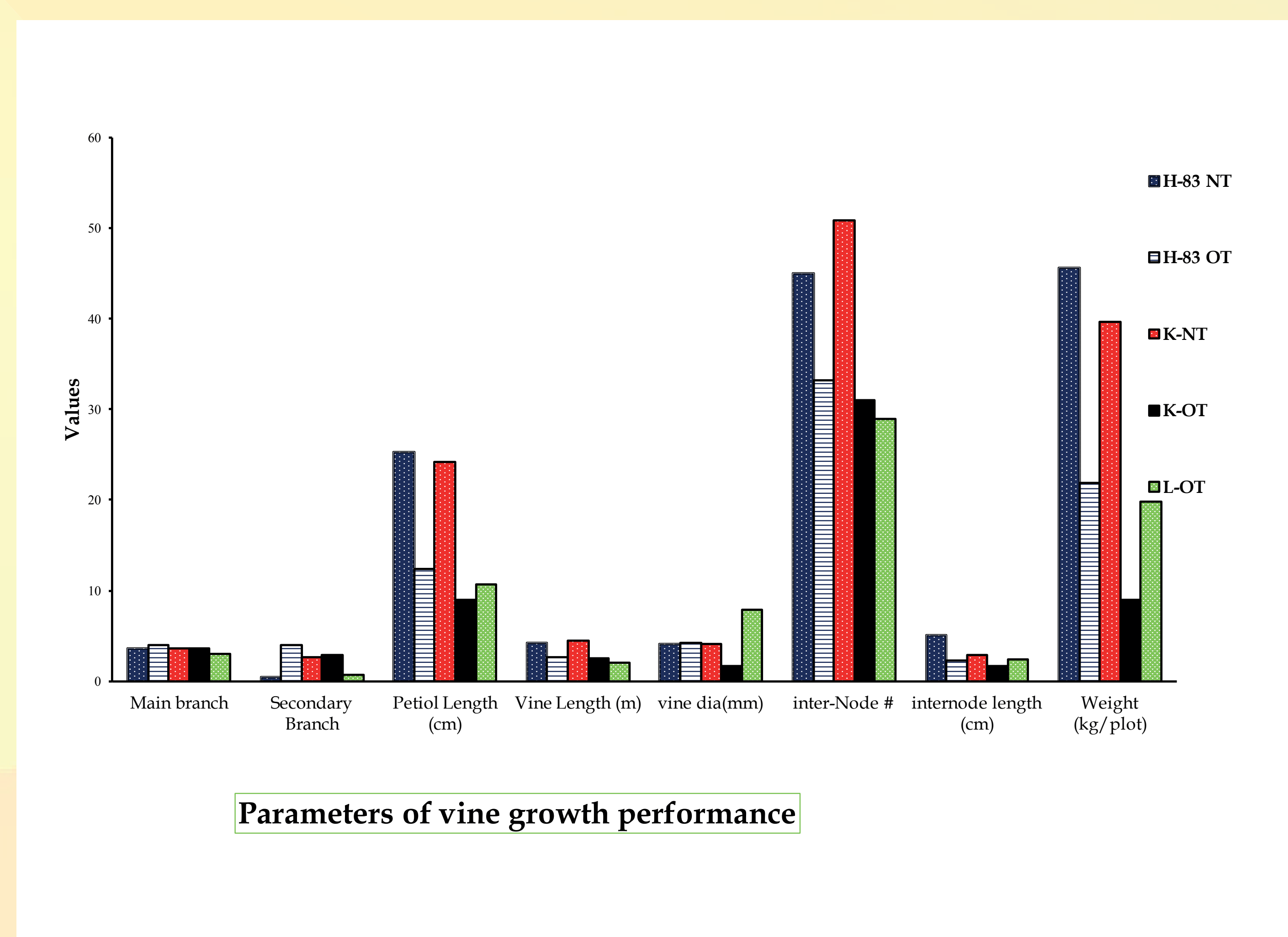


Figure 1: Agronomic performance of two sweetpotato varieties planted inside and outside insect-proof net tunnels. **H-83 & K** = variety Hawassa 83 and Kulfo, respectively. **NT** and **OT** = inside and outside net tunnel, respectively. **L-OT**= Local variety planted out side

Disease and insect pest pressure

Preliminary findings showed that plants grown in the net tunnels had low (3%) virus incidence and no new infections were observed after rouging out infected plants. On the other hand, plants multiplied in the open beds showed increasing infection over time (> 53%) within 8 months (Figure 2).

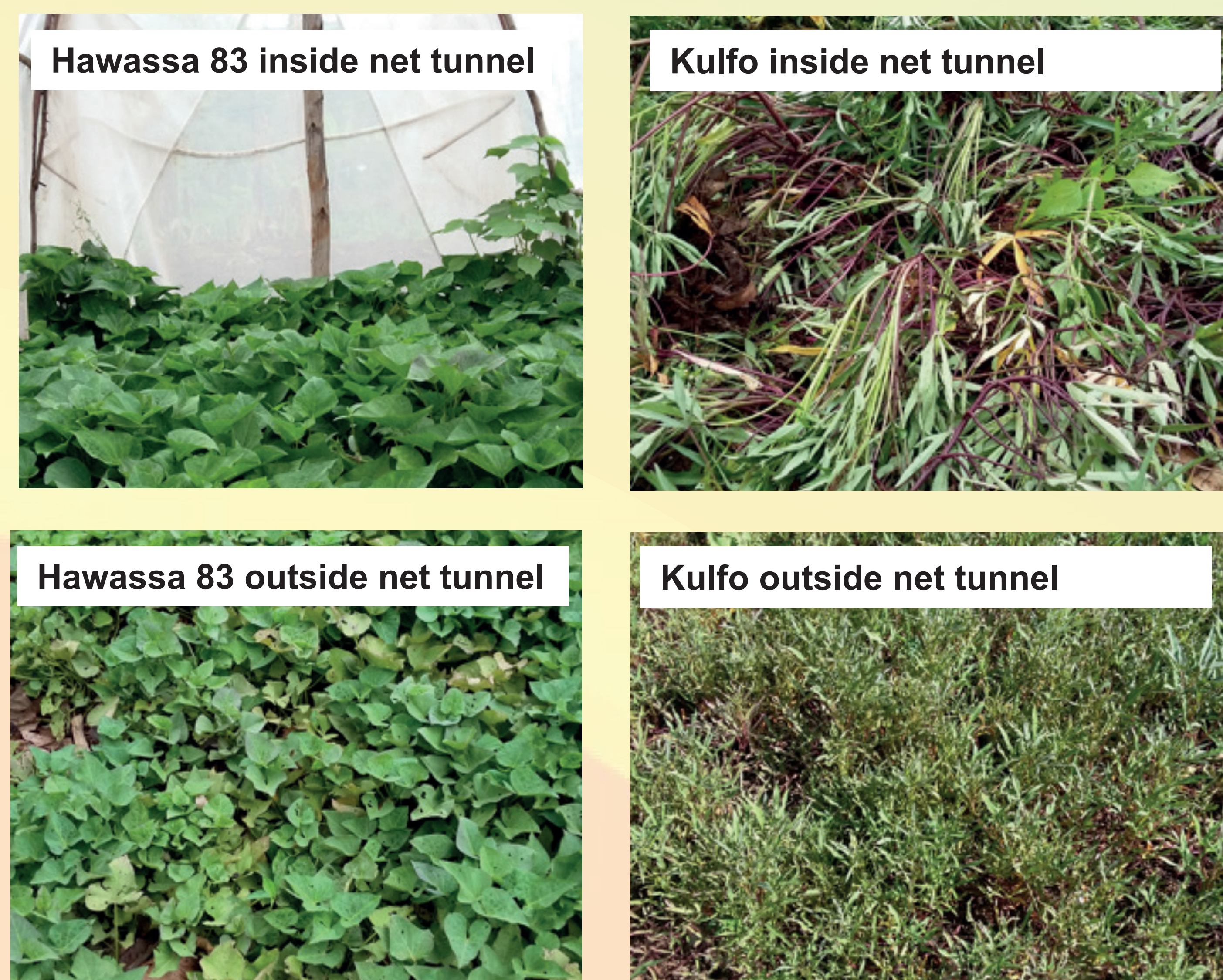


Figure 2: Disease pressure on plants grown inside the net tunnels compared to those grown in the open beds.

Weed Intensity



Figure 3: Weed pressure inside the net tunnels. Variety H-83 could suppress weed growth after first weeding, however, variety Kulfo required frequent weeding

Conclusions

This research has confirmed the key role played by insect-proof net tunnels in the production of clean sweetpotato planting materials. The micro climate inside the net tunnels favored superior vine growth with low virus and insect pest pressure but plants grown outside showed stunted growth with high virus and insect pest attack. However, there is the need to open the net tunnels before harvesting time in order to weed. Otherwise weed pressure will constrain growth of quality vines.