Rooted Apical Cuttings to Boost Potato Seed Systems in Kenya

PHOTO: M. PARKER (CIP)

Production of rooted cuttings in screenhouse.

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Seed potato farmers in Kenya's potato growing regions are adopting a new technology with potential to boost quality seed availability. The farmers are using rooted apical cuttings as starter material for seed production as opposed to certified seed. The cuttings technology has been introduced by the International Potato Center (CIP) through Feed the Future, Kenya Accelerated Value Chain Development (AVCD) program funded by the United States Agency for International Development (USAID).

A cutting is similar to a nursery-grown seedling except that it is produced through vegetative means and does not originate from a seed. Cuttings are produced from tissue culture plantlets in the screen house, rather than minitubers, and after rooting, are planted in the field. Each cutting produces 7 to 10, and up to 15+ tubers which are multiplied a further season or two, then the harvest is used and/or sold as seed. This means that the seed that farmers buy is high quality seed, equivalent to basic or certified one seed in seed certification systems, and will produce high yielding crops. With seed being available for farmers after two to three field generations of multiplication, seed tubers produced from cuttings are high quality planting material and can be multiplied on farm for a further few seasons without risk of significant seed degeneration.

In Kenya, within one year from planting the initial trial to test rooted cuttings, two private sector enterprises have invested in cuttings and the Kenya Agriculture and Livestock Research Organisation (KALRO Tigoni) seed potato unit has adopted the technology. Also 40 seed multipliers are trialing cuttings produced by the private sector, under project support. After receiving experimental cuttings and witnessing the productivity, they are investing in using rooted cuttings to produce seed.

The Kenya Plant Health Inspectorate Service (KEPHIS), regulating seed certification, has endorsed cuttings and is integrating the technology into seed potato certification protocol currently being finalized. Once the modified protocol is approved by KEPHIS, cuttings will be eligible for seed merchants to use as starter material to produce certified seed.

Key to the success of this technology is building market demand for cuttings, which relies on diversifying end-uses. Currently the technology targets seed multipliers, but expanding to ware farmers who practice

Transplanting potato rooted cuttings in the field. PHOTO D. BORUS (CIP)

14+ potato tubers per rooted cutting of varieties Shangi (left) and Konjo (center) and Unica (right), majority of which are sizeable for direct planting

PHOTO D. BORUS (CIP)

saving seed on farm will increase opportunities for private sector to invest in producing cuttings. The support from this opportunity would tap into projects that have already built the capacity of seed multipliers, and are in the process of licensing them as seed merchants to produce certified seed. This includes potato cooperatives that CIP supported their formation under the AVCD project. Additionally, the project already supports youth groups to develop into small businesses. Investing in rooted cuttings for seed production could be interesting for youth as little land is required, and profit margins are high.

Addressing seed shortages for potato in sub Saharan Africa is key to improving productivity of potato farming systems and resource use efficiency. Limited access to quality seed is largely responsible for the low yields spread across the region amounting to 10-15 t/ha. Using quality seed, produced using technology such as apical cuttings therefore has the potential to double, even triple, productivity offering opportunities to meet increasing food needs without increasing land use

Transplanting potato rooted cuttings in the field.

PHOTO: M. PARKER (CIP)

Production of seed potato from rooted cuttings by a seed multiplier Picture taken 5 weeks after transplanting

PHOTOS: M. PARKER (CIP)

in the field.

Producing potato rooted apical cuttings: Stokman Rozen Kenya

Stokman Rozen Kenya Ltd (SRK) is in the second commercial season of producing rooted potato cuttings having been involved in the trial phase with CIP as a partner.

"We are pleased at the current pace that this technology has been introduced, trialed and is fast gaining acceptance by seed producers", says Simon Ndirangu who works at SRK.

SRK has been in young plants propagation business for the past 20 years, mainly in the flower industry. Recently, the company has chosen to diversify its enterprise to contribute to food security in Kenya and has embraced potato cuttings.

"Backed by experienced staff in one of the best tissue culture laboratories in the country, we can multiply any potato variety that a client would want to produce seed from. At present we have in-vitro plants of the following varieties readily available for cuttings production: Dutch Robjyn, Unica, Konjo, Sherekea, Kenya Mpya, Asante and Desiree. We will be introducing Shangi, Lenana, Nyota, Chulu and Wanjiku varieties soon", notes Simon

In-vitro mother plants of these varieties are grown in a restricted access net house that is designed to keep out sucking pests that can introduce viral diseases. Cuttings from the mother plants are harvested, rooted in cocopeat plugs and are generally ready for delivery to clients within four weeks having been grown under a strict hygienic environment. The growing environment and hygiene procedures serve to guarantee quality of cuttings that meet and exceed all KEPHIS requirements for production of clean healthy cuttings.

SRK will continue playing its role in supplying clean and healthy rooted cuttings to fulfil seed multipliers demand locally.

Potato Processing; How New Holland Chips Ltd Does it

New Holland Chip Ltd is located at the slopes of Mount Kenya in Nanyuki, Laikipia County. Sitting on 20 hectares, the factory will revolutionize how we see food security in Kenya. It is a privately owned enterprise that is set to mechanize the planting, harvesting, and storage of potatoes to further increase food security. Thus the company will contribute to the attainment of food security which is one of the pillars embedded in the vision 2030 flagship project by the Kenyan Government.

The factory has been fitted with state of the art equipment with a production capacity of 1,000 kilograms per hour. The chips factory started operations in September 2017 and is set to directly employ 75 people. The building is made from steel structure with the latest high-tech insulation materials measuring 100m by 30meters, which include 4 cold stores, offices, laboratory and canteen.

Production line itself is over 80 meters long with washers, peeler, fryer, packing machine all fully mechanized. Potato Farmers in Mt. Kenyan and Nyandaruaregion benefit from the factory, which conducts weekly trainings with them and pre-finances the farmers to acquire the specific seeds needed. All potatoes used for processing are European varieties like Royal and Sarpo Mira (blight resistant).

New Holland potato processing plant in Nanyuki

The factory engages over 450 smallholder farmers across the region. For our farmers, quality and sustainability are important principles. Again, and again they look for a balance between a good harvest and the least possible environment impact.

The uniqueness of New Holland Chips factory has to do with its large storage capacity of 1,500 tons. This reassures farmers who have in the past incurred losses due lack of good storage facilities. The production process is sustainable, up to date, and efficient, which guarantees consistently high quality and freshness for our customers.

With innovation as a key driver, New Holland Chips is set to develop and produce a wide range of natural, fresh and tasty products which will meet the culinary expectations of consumers and positively surprise our customers.

The produce from the factory will be for local consumption and will target the Mount Kenya region, Nairobi and Mombasa markets.

For more information, kindly visit www.newhollandchips.com