

## **IMPLEMENTATION OF POTATO REGULATIONS IN NYANDARUA COUNTY**

Nyandarua County, one of the biggest producer of potatoes in the country, continues to engage key players with a view of improving potato subsector in the county. On 7<sup>th</sup> August 2019, the county organized for a planning meeting to discuss how the implementation of potato regulations would be implemented in the county. In attendance were Agricultural Food Authority (AFA), Kenya Police Service, Public Administration, County Ministry of Agriculture, weights and measures department, County enforcement unit, Agricultural Sector Development Support Programme (ASDSP), Agricultural Council of Kenya (AgCK), International Fertilizer Development Centre (IFDC), Kenya Climate Smart Agriculture Project (KCSAP), NPCK, farmers and other stakeholders.

Among the deliberations was enforcement of the potato packaging provision, joint implementation approach. Fast tracking of registration of farmers, farmer associations, transporters, dealers and collection centers was also discussed. The purpose of the regulations is to guide the promotion, development and regulation of production and trade in potatoes.



**Nyandarua County Agriculture CECM Dr. James Karitu (front row) and other participants during a stakeholders' planning meeting on 7<sup>th</sup> Aug 2019 in Nyandarua.**

## **NEW POLICY GUIDELINES ON IMPORTS INSPECTION**

The Kenya Bureau of Standards (KEBS) organized a workshop on 16<sup>th</sup> July 2019 in Nairobi to create awareness on a new government policy that requires all imports including agricultural produce to undergo a pre-export inspection at country of origin. All imports are now expected to have a Pre-Export Verification of Conformity (PVoC) certificate on arrival in the country.

The workshop was attended by various import and export companies, NPCK, Seed Traders Association of Kenya (STAK) among others. The participants discussed the impact of the PVoC and also proposed changes to the legal framework that will guide the implementation of the government policy directive. The government's intention to reduce the number of institutions involved in clearance at ports of entry was hailed as a positive step as it is bound to increase efficiency and reduce costs associated with delays in clearance. However, a directive that followed from the Head of public service, which adopted a generalized approach and among other things it stopped KEPHIS from inspecting imported plant

material jeopardizes potato industry and agriculture in general. However, stakeholders have raised this concern and are expecting corrective measures to be taken.

### **POTATO CURING TO REDUCE POST HARVEST LOSSES**

Most farmers contribute to post harvest losses unknowingly by use of sharp objects during harvesting hence causing cuts on the tubers. These cuts comprise of injuries to the tissues and because the tubers are already detached from the mother plant, the ability to heal is greatly reduced. The cuts also open ways for pathogenic infections and increased production of ethylene gas which stimulates rotting of potatoes.

Potato tubers, just like any other vegetable, continue with physiological processes such as respiration and transpiration even after they have been harvested. Due to these processes, there is gradual reduction of energy levels and water loss usually exhibited by shrinking of the tubers and their eventual deaths. This contributes to post harvest losses

One way of reducing post-harvest losses in potato farming is by practicing curing of potatoes immediately after harvest and before storage. Potato curing is whereby the tubers are cleaned after harvest to remove excess dirt and stored in an aerated dry conditions, preferably ventilated crates, at a temperature range of 9-11<sup>0</sup>c and high humidity (above 90%) for fourteen days. It is also advisable to do it in an enclosed environment with ventilations to allow air circulation which helps in preventing entry of pest such as aphids and rodents which can as well cause damage to the tubers.

Cured potatoes have less buildup of ethylene gas during storage hence reduced chances of rotting. Curing helps in: quick healing and drying up of wounds on tubers that were caused during harvesting; hardening of the skin which minimizes physical injuries and possible pest attack; reduce the dormancy period of potatoes meant for use as seed potato; and the browning effect caused by cuts is controlled from extending to the rest of the tuber hence maintaining its tasty quality.



*Potatoes kept in an airy room to allow for curing.*

*Courtesy of morningchores.com*

### **MOLO FARMERS TRAINED ON POTATO POST HARVEST MANAGEMENT**

On 29th August 2019, Egerton University organized for a Potato Post Harvest Management training at Baraka Agricultural College in Molo. The farmers were trained on a range of topics such as potato harvesting, sorting, storage, grading and packaging. The training was conducted by Dr. David Picha, a professor of horticulture at Louisiana state university in U.S.A.

NPCK took the opportunity to sensitize farmers present about Crops (Irish Potato) Regulations 2019 and the Viazi Soko ICT Platform, a web based SMS platform that is used to collect process and disseminate information on seed and ware potato. It is also used to send advisory messages to farmers. The farmers were trained on how to: register on the platform, inquire on seed potato variety availability and ware potato market prices in major towns. They were also trained on how to market their ware potato on the platform.



*NPCK staff sensitizing Molo potato farmers on the Crops (Irish potato) regulations 2019 at Baraka Agricultural College.*

### **FARMERS' TRAINING ON APICAL CUTTINGS**

Certified seed potato production in the country does not meet the current demand. Only less than 4% of the required quantity is produced and supplied. The current seed systems rely on production of minitubers from tissue culture plants in a screen house followed by three to four seasons of multiplication in the field to generate certified seeds.

As part of addressing the shortage, apical cuttings technology, which constitutes a rapid seed multiplication method, is seen as a promising alternative. However, there is a misconception that the apical cuttings are planted directly and in turn ware potato is harvested.

In practice, the cuttings must first undergo further multiplications in order to get seed potato which can in turn be planted for ware potato production.



Cuttings have a high productivity and it is economical to sell seeds from it after two to three seasons of multiplications compared to the certified seeds that is normally sold after four seasons of multiplication. Through this approach, farmers have access to earlier generation seed thus the harvested tubers can be multiplied on-farm for a few seasons without significant seed degeneration as long as good agricultural practices are followed. According to International Potato Centre (CIP) the above attributes make seed systems based on cuttings compatible with seed saving smallholder farming systems.

It is for this reason that NPCK in conjunction with Farm Inputs Promotions-Africa LTD (FIPS) organized farmers for training on apical cuttings in Timau, Buuri west sub-county, Meru County. The training took place on 29<sup>th</sup> July 2019 with selected 14 farmers in attendance. The farmers were taken through; nursery bed preparation, making of rows within the nursery, inter- row spacing, removal of cuttings from trays and transplanting them on the nursery bed. A total of 200 cuttings of Unica potato variety were used. The demo was done on a 6M by 8M plot of land. The group will now have one member utilize the technology and multiply seeds on behalf of the rest.



*On the left a farmer preparing nursery bed during the training while on the right are the 200 cuttings of unica variety used for the demonstration.*

## GIZ supports Mechanization Service Providers (MSPs) Training



MSPs learning how to calibrate a potato ridger to the required depth

Maintenance of mechanisation equipment is fundamental in mechanization business operation. Proper machinery use and care maximizes the work-days and the lifespan of the machinery by reducing the incidences of breakdowns which can result in costly downtime. It is very important that power-matched implements are used effectively, efficiently and kept properly maintained on a regular basis.

Most Mechanization Service Providers (MSPs) have limited skills and exposure to tractorization especially the modern machines and latest equipment beyond the plough. They also have limited knowledge on equipment adjustments, calibration for optimal operations, applications and safe use of the equipment. New farming methods have since come into play, necessitating the need for training MSPs including those that have been in the operational business for long. Apart from operational performance of machinery and equipment, most MSPs do not keep records. Records provide the overall performance of the mechanization service provision through availing data on machine use, tracking equipment performance and routine maintenance schedules.

During the month of August 2019, GIZ -Nutrition Sensitive Potato Partnership Project(NuSePPP), Agrimech Africa Ltd and AMS Nyandarua County trained a team of 25 MSPs/ Tractor operators on theoretical background of tractor and implement use for different crop and livestock mechanization applications, principles and practice of specialized tractor. The training also provided practical lessons on implement parts (such as engine and engine parts, batteries, power train- transmission, hydraulics, tyres and tracks, bearings, PTOs and knotters), tractor-implement calibration, servicing, routine maintenance and safe-use of machinery among other topics.

The content was relevant to the trainees' day-to-day operations and some of them testified to have unknowingly mishandled their tractors for a long time and were grateful for the training. They promised to apply the knowledge and skills gained in their operations and requested for follow-ups and refresher courses in the near future.



Intensive training on part inspection and servicing at Tabor Hill



## GIZ AND SERENI FRIES PARTNERSHIP FOR YOUTH EMPLOYMENT IN POTATO PRODUCTION AND PROCESSING

GIZ- NuSEPPP has partnered with Sereni Fries, a potato processor, on youth empowerment and employment creation within the framework of develoPPP.de where GIZ collaborates with private companies with contributions from both parties to address a common objective. In this partnership, GIZ has identified five youth farmer groups with over 150 members in Nyandarua County that are being supported to grow processing varieties such as Dutch Robijn, Destiny, and Markies and have received training on aggregation, sorting, grading, value addition, and contract farming.



**Inset: Crips processing equipments for Sereni Fries supported by GIZ**

GIZ has also supported Sereni Fries to expand its production line by introducing crisps product named *Tasty bits*. This is a positive step towards embracing more varied potato use which in turn provides an opportunity for expanding the market for processing varieties. The Sereni crisps processing line has provided employment opportunities to 10 youths (6 women and 4 men) .

To date, 150 farmers have been contracted by Sereni Fries and many more are anticipated going forward. Other support to the farmers includes linkage to financial institutions for access to credit. GIZ is working with Tower Sacco in Nyandarua County where over 100 farmers have accessed input loans of over five million Kenya shillings in first season (May-August 2019). The farmers have also benefited from financial literacy trainings from the Sacco.



**Inset: CEO of Sereni Fries, (centre) displays his new crisp product at the 2019 National Potato Conference and Trade Fair.**

## CROP MANAGEMENT PRACTICES IN SEED POTATO FARMING

Crop Management refers to the agricultural practices used to improve the growth, development, and yield of agricultural crops. During crop growth, it is necessary for potato farmers to observe good agricultural practices (GAPS) which contribute towards achieving quality yields. The following are some basic crop management practices in seed potato farming.

- **Climate requirement** – Potato grows best in cool conditions with temperatures ranging 10 to 23°C and rainfall of 900-1400 mm per year. Three months of rainfall is required for good growth and an altitude of 1500m-2300m above sea level.
- **Soil Testing** – Take soil samples from the appropriate sites for testing for Fusarium wilt, bacterial wilt, potato cyst nematode (PCN) and nutrient analysis by a recognized laboratory before planting on the selected site.
- **Soils** – Select a site that has not grown potato, tomato, suja or pepper (solanaceous crops) for at least four seasons. Potato does best in loose, well-drained soil, that has been worked deeply (2 jembe's deep) to remove all clumps. Poorly drained soils often cause poor stand and low yields, while heavy soils can prevent shoots from emerging, roots and tubers from growing in the soil, and cause tubers to be small and deformed. To prepare for planting, the land should be cleared and ploughed.



### *Field ready for planting potatoes*

- **Seed** – Disease free or certified seed tubers should be used. 1 ha will require 30 to 50 (50 kg) bags of seed tubers, depending on their size. Seed tubers should have sprouts before planting to be sure that dormancy has finished. Be sure to use quality seed obtained from healthy plants. You can save your own seed by selecting healthy plants during the growing season and using tubers from these plants for seed, or obtaining seed from trusted seed producers. Do not use small potatoes from the market for seed, they are unmarketable because they are small and full of disease. There are many varieties available, and variety choice will depend on many things, such as your location and market
- **Planting** – Spacing: 75 to 90 cm between rows, and 30 cm between tubers in a row. Plant tubers 10 to 15 cm deep. Fertilizer is applied before planting. The fertilizer should be well mixed with soil to avoid direct contact with the seed tuber. The tubers should be placed with the sprouts facing upwards. Planting should be done before the rains start, but when the soil is moist.



□ 30cm between seeds □ 75 cm between rows

- **Soil Moisture** – Essential during emergence, tuber initiation and tuber expansion stages. Usually potato crop relies on rainfall and where it is irregular it can be supplemented with irrigation. Irrigate up to a stage when the soil is squeezed and released it does not leave mud in the hand. Ensure the quality of irrigation water is tested for suitability
- **Crop Protection** – Timely spraying and correct choice of crop protection solutions saves costs and prevents disease spread giving plant sufficient time to grow and give high yields. Regular scouting for pests and diseases to determine when to control is recommended.



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*Timely spraying and correct choice of crop protection solutions saves costs and prevents disease spread*

- **Hilling** – Hilling or earthing up should be done twice, the first at 75% emergence and the second 2-3 weeks later. Adequate ridge volume is essential to give ample room for tuber expansion, to prevent potato tuber moth from tunneling the tubers and to prevent them from being exposed to light.





### ***Hilling***

- ***Rogueing*** - A seed grower has to keep on removing (rogueing) off types and diseased plants from the seed crop to ensure purity and health of the seed. Rogueing should start early (as soon as disease symptoms are visible) and done continuously till crop maturity.

Source from : KEPHIS SEED POTATO PRODUCTION AND CERTIFICATION GUIDELINES & POTATO PRODUCTION GUIDE AND HANDBOOK

## **HEALTH BENEFITS OF POTATOES**

Potatoes are edible tubers, available worldwide and all year long. They are relatively cheap to grow, rich in nutrients and they can make a delicious meal. The fiber, vitamins, minerals, and phytochemicals it provides can help ward off disease and benefit human health. Some of the health benefits of potatoes include:

- 1) Bone health**-The iron, phosphorous, calcium, magnesium, and zinc in potatoes all help the body to build and maintain bone structure and strength. Iron and zinc play crucial roles in the production and maturation of collagen- the protein responsible for skin elasticity which also plays a role in joint and bone health. Phosphorus and calcium are both important in bone structure, but it is important to balance the two minerals for proper bone mineralization.
- 2) Blood pressure**-A low sodium intake is essential for maintaining a healthy blood pressure, but increasing potassium intake may be just as important. Potassium encourages vasodilation, or the widening of the blood vessels which regulates blood pressure.
- 3) Heart health**-Potatoes contain significant amounts of fiber. Fiber helps lower the total amount of cholesterol in the blood, thereby decreasing the risk of heart disease. Together with potassium, vitamin C and vitamin B6 content, coupled with its lack of cholesterol all support good heart health.
- 4) Inflammation**-Choline is an important and versatile nutrient that is present in potatoes. It helps with muscle movement, mood, learning, and memory. It also assists in maintaining the structure of cellular membranes, transmitting nerve impulses, absorption of fat and early brain development.

**5) Cancer-**Potatoes contain folate. Folate plays a role in DNA synthesis and repair, and so it prevents many types of cancer cells from forming due to mutations in the DNA. Fiber intake from fruits and vegetables like potatoes are associated with a lowered risk of colorectal cancer. Vitamin C and quercetin present in potatoes also function as antioxidants, protecting cells against damage from free radicals.

**7. Alleviate Kidney Stones-** Raised uric acid levels in the blood is the main contributor of kidney stones. The hard masses of calcium crystals in urine can create painful stones that are excruciating to pass. Those suffering from kidney stones can find many extra benefits from ingesting the entire potato peel, a rich source of such relieving nutrients as alkaline salts, copper, manganese, potassium, and B-vitamins.

A 100-gram (g) is a little more than half of a medium size potato. This much white potato, baked with skin, contains:

- |                                 |                                 |
|---------------------------------|---------------------------------|
| • 94 calories                   | • 0.64 mg of iron               |
| • 0.15 grams of fat             | • 27 mg of magnesium            |
| • 0 grams of cholesterol        | • 75 mg of phosphorus           |
| • 21.08 grams of carbohydrate   | • 544 mg of potassium           |
| • 2.1 grams of dietary fiber    | • 12.6 mg of vitamin C          |
| • 2.10 grams of protein         | • 0.211 mg of vitamin B6        |
| • 10 milligrams (mg) of calcium | • 38 micrograms (mcg) of folate |

**8) Metabolism-**Potatoes are a great source of vitamin B6. This plays a vital role in energy metabolism, by breaking down carbohydrates and proteins into glucose and amino acids. These smaller compounds are more easily utilized for energy within the body.

**9) Skin-**Collagen is the skin's support system. Vitamin C works as an antioxidant to help prevent damage caused by the sun, pollution, and smoke. Vitamin C also helps collagen smooth wrinkles and improve overall skin texture.

**10) Immunity-**Research has found that vitamin C may help reduce the severity and duration of a cold. Potatoes are a good source of vitamin C.



***Cooked potato -Research has found that vitamin C may help reduce the severity and duration of a cold. Potatoes are a good source of vitamin C.***

*Photo courtesy of pixabay.com*



***Freshly harvested potatoes: Potatoes can be healthful if prepared in the right way. One large potato contains 57 mg of choline. Adult males need 550 mg, and females 425 mg a day.***

Source: <https://www.medicalnewstoday.com/articles/280579.php>



## POTATO GOODNESS

### RECIPE-POTATO PIE

#### Ingredients:

- Large sized potatoes
- Minced meat
- Eggs
- Cooking oil

#### Method

- Boil the potatoes, mash and mound them into ball shapes.
- Cook the minced meat in your desired flavor until its ready.
- Make a hole in the round shape mashed potatoes and stuff the minced meat inside them.
- Beat the eggs completely in a separate bowl and dip the potatoes inside until well coated .
- Pick them out one by one and deep fry them for few minutes.
- You can prepare your desired kachumbari and enjoy together with the potato pie.



*Potato pie served with salsa salad.*