Yes, our potato output is low but we can do better

Potato storage is a viable investment option

How we can increase production of certified seed potato in Kenya

Promoting Potato Production for Food Security & Agribusiness

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SNV
The National Potato Council of Kenya (NPCK) welcomes you to read through 2018 edition of Potato Magazine. The year was full of activities and events that went a long way in not only fulfilling our mandate but also contributing towards the attainment of the food security pillar as spelt out by the government in the Big Four Agenda.

I need not mention that as the second most important staple crop grown in Kenya, after maize, and before rice, potatoes are extremely valuable to the country. Indeed, some call it a super crop because of its impressive nutritional value. The tubers are not only loaded with protein, carbohydrates, vitamins and minerals but they are also free of fat, sodium and cholesterol. Certainly, this is a crop that we, as a country, cannot do without which is why the NPCK is committed to improving the potato subsector. This is a commitment we share with other stakeholders. Among the many other activities undertaken to improve the subsector during the year, NPCK organized two regional potato fairs during which farmers met exhibitors and trainers who showcased and educated them in demonstration plots on their products’ as well as proper agronomic practices. We also organized the annual national potato conference whose objective was to provide a platform for sharing information on potato value chain issues, technologies and innovations. I am grateful for the contribution made by our partners including the State Department of Agriculture, County Government of Nakuru and Nyeri, GIZ, Kingdom of the Netherlands, AFA, Africa Lead, Alliance for the Green Revolution in Africa, Baraka Agricultural College, CIP, Egerton University, GRIMME, Grow Africa, KALRO, SNV and Wambugu Farm ATC in support of these events. We could not have succeeded without their collaboration and support.

In this issue, we provide valuable information on what is causing the reduction in potato yields in the country and what farmers and other stakeholders in the subsector can do to alter the prevailing trends. We offer tips on how to secure good yields. But we have not stopped there; we believe readers - and especially those in the industry - will find Dr. Esther Kiman’s expert advisory on how we can increase production of certified seed potato in Kenya, very informative. Dr. Kimani, who heads KEPHIS, has gone out of her way to offer an insider account not only on how KEPHIS works, but also on how the institution partners with other cooperatives to boost the production and supply of certified seeds potato in the country.

If you are a smallholder seed grower willing to venture into the production of certified seed, Dr. Kimani informs you that KEPHIS has a special arrangement for you through which you can partner with KALRO’s Seed Unit which supports small scale growers, who may not afford to register seed companies. Not to be left behind is the International Potato Centre (CIP) which, as one of the stories demonstrates, has been helping farmers to produce disease-free planting materials. We highlight the story of one beneficiary, Samuel Kibet Sugut, a farmer who has embraced the new agribusiness and is smiling all the way to the bank. As Dr. Dinah Borus from CIP explains, producing such planting materials involves apical cuttings that are then vegetatively produced. This is a quick method of obtaining large amounts of planting materials within a short time.

We also highlight the potato storage scenario in an article that shows how players in the industry have overlooked this area. Indeed, this is one area of the industry that has not seen any investment worth writing home about. This is unlike in the maize subsector where the government and other players have set up storage facilities to guarantee strategic reserves. We share the writer’s conclusion that potato storage is a viable investment option especially for processors, restaurants, chains and traders. Those willing to invest in storage need to know that although the initial investment cost is bound to be high, this can be scooped back in 2 to 3 years!

Finally, I welcome readers to the article on a nutritional project funded by the German government that targets potato farmers in Nyandarua and Bungoma counties. At NPCK, we note with satisfaction that over the course of this year, thousands of the farmers have benefited from an intensive training and have gone on to share the knowledge on how to diversify diets with their counterparts across the two counties.

Of course, there are many other stories which I cannot highlight here due to limitation of space. My hope though is that readers will sample them and give us feedback.

Karibuni na Asante
Esther Kagugo, Liaison, Partnership & Communication

I welcome you all to read the third issue of the Potato Magazine 2018. I also thank all the actors and players for the increased interests and activities in the subsector. It is through your continued support, commitment and contributions that together we are able to transform the potato industry. Although we are not where we should be, I am happy to say that the Potato Council continues to make commendable strides in various fronts that include advocacy, awareness creation and increased partnerships.

Firstly, I would like to bring to your attention the following important initiatives that the Council and partners are undertaking in their endeavor to improve businesses in the potato subsector:

1. Viazi Soko, an online and SMS based ICT platform has successfully registered over 60,000 potato farmers which is a big improvement having increased from 8,000 in 2017.
2. Supporting 22 farmer groups and cooperatives to access inputs, services and linking them to the market.
3. Supporting more private sectors to invest in seed potato value chain to increase production targeting of up to 10% of the seed requirement by 2022.
4. Distribution of Monthly E-newsletter and development of the annual potato magazine.
5. Offering advertising platform to our Stakeholder through the Viazi Soko platform.
6. Increased partnership with research institutions such as University of Nairobi, Egerton University, Jomo Kenyatta University, KALRO and other stakeholders to conduct more potato related research.
7. Organizing the annual National Potato Conference and regional potato fairs.
8. Mapping Market Outlets for market linkages and forming County potato marketing forums.
9. Overseeing Contract farming for various potato farmer groups.
10. Partnering with Counties to develop County Potato Strategies and County potato coordinating units.
11. And many more initiatives.

Secondly, I would like to thank KALRO for continued support in providing NPCK office space, AGRA for funding the office refurbishment and GIZ for supporting the process of settling in the new offices.

Let me also thank the “Potato Team”, which was made up of NPCK staffs and partners, for participating in this year’s Standard Chartered Marathon in style. The Potato Team had 47 members who were representatives from the Ministry of Agriculture Livestock, Fisheries & Irrigation state department of crops, Agrico, Kevian Kenya, Kirinyaga seeds Co, Sereni Fries and NPCK staffs and board members. The objective was to create awareness about the importance of potato as a food and cash crop in Kenya. I would like to encourage other members of the Council to join the potato team in future events. This will help us continue strengthening partnerships in the industry.

Finally, I am grateful for the contribution made by our partners in organizing the National potato conference and regional (county) trade fairs. These included the State Department of Agriculture, County Government of Nakuru and Nyeri, GIZ -German Development Cooperation, Kingdom of the Netherlands, Agriculture Food Authority (AFA), Africa Lead, Alliance for the Green Revolution in Africa (AGRA), Baraka Agricultural College, International Potato Centre (CIP), Egerton University, GRIMME, Grow Africa, KALRO, SNV, the Netherlands organisation and International Fertilizer Development Centre (IFDC) for supporting the development and distribution of this magazine.

Wachira Kagugo

Contents
Yes, our potato output is low but we can do better, Pg 15
Potato storage is a viable investment option, Pg 20
How we can increase production of certified potato seed in Kenya, Pg 25

Company Profiles, Pg 32

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National Potato Council Organizes Successful Events In 2018

Jointly with its partners, NPCK organized two regional fairs and an annual national conference during which stakeholders met to discuss and showcase innovations in the sector. This was part of efforts that saw more platforms opened to players in the potato subsector in the country in the year, many of which were exhibitions, conferences and field demonstrations.

The first was the Eastern and Central region potato fair held in Nyeri at the Wambugu Agricultural Training Centre in Nyeri County. It was held on February 16th under the theme: “Enhancing technologies in the potato value chain for food security and agribusiness.”

Usually, regional fairs take new innovations in potato farming to farmers at their doorstep or rather at their farm-gate. Exhibitors showcase and educate farmers in demonstration plots on their products’ as well as proper agronomic practices. This has made the training and the regional fairs popular with farmers.

During the event in Nyeri, different potato varieties and technologies were showcased on the 19 potato demonstration plots while 36 exhibitors from across the value chain displayed their products and services. Participants were also trained on new seed production innovation and technologies; new and improved potato varieties with better yields; methods of farming and input application; soil and crop nutrition, as well as organic farming and crop financing and insurance.

The regional fair was officially opened by the Director of Agricultural Schools, Dr. Henry Nlego, who represented the Cabinet Secretary, Ministry of Agriculture and Irrigation, Hon Mwangi Kiunjuri. Some 34 partners, over 1,000 farmers, county executives in-charge of agriculture docket from Nyandarua and Nyeri counties attended.

It was officially closed by Mutahi Kahiga, the Nyeri Governor, who challenged potato researchers to come up with fast-maturing potato varieties in order to address the food situation in the country. The governor condemned the use of extended bags in potato packaging and selling the produce by bags noting that this was hurting famers financially. He pledged to work with fellow governors from other counties such as Nyandarua, Kirinyaga, Kiambu and Nairobi in not only passing laws on potato maximum bag weight and selling by weight but also in implementing them within the relevant areas of jurisdiction.

Genuine interest

A similar event was held on August 31, 2018 at the Baraka Agricultural College in Nakuru County Dubbed the South Rift Potato Fair, the event brought together over 1,000 farmers from within and outside the County, 29 exhibitors and other stakeholders including counties and the national governments.

Just like the event in Nyeri, the exhibitors were impressed by the genuine interest of the farmers to learn, network and purchase their products with some running out of stock before the end of the day. Those in attendance were amazed by the performance of the crop at the demonstration plots and appreciated the practical knowledge shared there.

Increasing awareness & knowledge

This year’s National Potato Conference and Trade Fair was held on May 24th-25th at the Kenya Agricultural and Livestock Research Organization (KALRO) headquarters in Loresho, Nairobi. The annual event is aimed at increasing awareness and sharing knowledge on innovations and technologies needed to develop agribusinesses in the subsector. The conference also provides an opportunity to all players to look at the state of the subsector and to review activities in the past one year while planning for the next one.

In line with the government’s plan, the event was held under the theme: “The big four Agenda: Enhancing potato agribusinesses for improved food and nutrition security.” During the conference, potato packaging and pricing regulations were officially launched. In addition, representatives of farmer groups were trained on Comprehensive African Agriculture Development Programme (CAADP) principles and budget making processes with public participation being

Panelists of the discussions on optimizing potato production in Kenya to contribute to BIG 4 Agenda on food security and match Global Standards during the National Potato Conference and trade fair.
emphasized in the formulation of suitable regulations and policies in the subsector.

Further, the need for all stakeholders to work together to overcome the challenges facing the industry was stressed.

**Potato, a super food**

In his speech Dr. Mathias Brown, Head of GIZ in Kenya & Somalia, expressed concern that the full potential of potato crop was yet to be fully realized including its nutritional value.

There is more emphasis on processing of potatoes but very little is said about the nutritional aspects of potatoes. The fact that potato is high in vitamin B3 and B6 is not recognised at all,” he said. He added that his organization was implementing strategies that aim at alleviating malnutrition through the use of potatoes.

The nutritional value of potatoes was one of the major talking points during the conference. It was noted by most speakers that the crop’s nutritional importance has been overlooked.

“Farmers see potatoes as purely a commercial commodity and will sell all their healthy potato harvest and feed their families on the rejects which have little or no nutritional value and therefore miss out on health benefits. We all need to reap the health benefits of the crop just as we make money out of it. Potato is a super food with a lot of nutrients including vitamin C,” said Gladys Mugambi, from Nutrition and Diabetics Unit, Ministry of Health.

Echoing her sentiments was Dr. Peter Mokaya, the Managing Director, Organic Consumers Alliance, who said that poor preparation and consumption of potatoes has led many to think of the potato as being unhealthy. For example, he pointed out the trans-fat oil used in chips preparation is absorbed by the potatoes and that while eating, salt is also added hence making chips quite unhealthy food. Chips should be prepared with the right oils, he told participants.

“Vitamins in potatoes are found under the skin and so it is recommended that one boils or bakes potatoes and eat them with the skin.” Dr. Mokaya also cautioned farmers against the use of toxic farm inputs.

**Government’s plan**

The event was officially opened by Dr. Richard Lesiyampe, the Principal Secretary Ministry of Agriculture Livestock and Irrigation state department for Crops Development who represented Mwangi Kiunjuri, the Agriculture Cabinet Secretary. Dr. Lesiyampe outlined the government’s plan of improving agriculture in general, and potato farming, in particular, as encompassed in the Big 4 agenda.

The PS said that together with Indian government they have pumped some $10 million (over Ksh1 billion) for a mechanization project that will see a change on how farming is done in the country. However, he noted that there is no data on farmers’ needs which had made it difficult for the government to address them. However, he said that the government had embarked on a country-wide registration of farmers and urged them to support the team of enumerators who would be visiting them. According to Dr. Lesiyampe, the data will also be useful for companies that target the agricultural industry including financial institutions.

**Thematic areas**

The participants’ discussions centred on four thematic areas: Building a supportive business environment for potato sub-sector in Kenya through policy and regulation. Optimizing potato production in Kenya to match global standards. Improving market efficiency for the potato sub-sector, and Innovation in the potato value chain. The four constituted the basis of plenary discussions led by experts.

**Farmers’ experiences**

Members of the Kirimara farming group from Meru-through their chairperson, Mrs. Florence Kinoti narrated their experiences as potato farmers including the setbacks they face as well as their successes. The group practices contractual farming and collective input procurement. Their growth story was of great relevance and inspiration to other farmers in the conference.

Dr. Biange Ndemo, lecturer at the University of Nairobi, who was one of the panelists, asked the farmers a number of questions about production cost productivity and pricing. The farmers took rather long to answer and eventually did so with much uncertainty. This prompted the former Permanent Secretary in the Ministry of Information and Communication to remark, “if one does not know the cost of production in their farm, then they should not start it. Farming is more scientific and it’s not just about planting.”

After calculating the profit together with farmers, he concluded that in order to break even, a potato farmer ought to have harvested at least seven tons per acre. He informed the participants that any farmer in the country doing less than the amount was operating at a loss.

Dr. Ndemo decried the approach to agriculture terming much of it as based on “guesswork.” He called on the participant to adopt a more systematic approach to farming by embracing “big data technology for precise and informed decision making.” He compared the country’s potato production to that of Israel where farmers get an output of 40-45 tons per acre. The only difference, he said, was that Israel has mastered the craft of harnessing and utilizing big data in their farming.

**Seed certification**

Dr. Esther Kimani, the Managing Director of KEPHIS, informed the participants that her institution was ready to work with county governments to develop their capacity in seed potato production and certification. She advised farmers to identify and work with a certified breeder (e.g. KALRO) so that they can be allowed to be using its license to multiply seed under the breeder’s guidance.

Farmers raised their concerns over the business environment with some saying that the cost of building a proper storage facility is too high.

The Governor of Elgeyo Marakwet, Alex Tolgos, who was also a main guest and a panelist, responded by telling participants that agricultural budget was in the hands of farmers (through stakeholders involvement in the budgeting process) and that during the budget process, equitable development law is applied which gives people the opportunity to decide how funds are spent in the counties. He added that 80% of the county budgets are spent at the ward level and the farmers are the decision makers. County assembly
Favorable policy in potato industry with improved regulations and the development of the economy production. The Potato subsector of investment in agriculture is key for government in support an enabling environment; which growth through enhancement of quality seed potato, improving processing varieties. This led to the improved production of certified seed potato and increased high-yielding and processing varieties. Additionally, stakeholders in seed industry developed a law to allow authorization of private inspectors in seed certification from KEPHIS. These changes in policy were done to address the initial legal bottlenecks and unlock the opportunities in the value chain through efficient seed certification service delivery. Marketing of potatoes has also been faced by myriad of challenges that include use of extended bags and pricing per bag. The regulation on maximum 50-kg packaging bag and pricing by weight that provided guidance on potato marketing was stipulated in AFFA Act 2013. The implementation of this regulation was however challenged in court in 2014 by traders who cited lack of involvement in its development. The AFFA Act was amended giving the Cabinet Secretary, State Department of Agriculture, the power to guide the maximum weights for each crop through a legal notice. Efforts to fast-track the development of potato marketing regulations were carried out by the NPCK who partnered with the MoALF & I and AFA. Following this, several meetings were held which saw the Cabinet Secretary, MoALF & I through the Principal Secretary Crops, Dr. Richard Lesiyampe, launch the public participation for stakeholder’s involvement in the process of developing regulations. This supported Lesiyampe’s pronouncement during the National Potato conference on May 25, at KALRO Headquarters, Loresho. Consequently, the AFA and NPCK working with the government and the private sector and national and county agricultural extension officers. The feedback from the public participation was consolidated by a team of experts and a validation workshop organised. The potato regulations have since gone through the assessment and review by the Attorney General’s office. The Cabinet Secretary has in accordance to the law, approved the gazettement of the regulations giving the public 14 days to review them. The reviewed regulations has undergone a National validation workshop, and is awaiting a parliamentary approval, gazettement and thereafter implementation NPCK and other partners are currently in the process of reviewing the seed regulations to adequately address the issues affecting vegetable propagated materials. The on-going review of the national seed policy is also crucial in capturing the new technologies, emerging issues such as pest and diseases and proposing the effective seed systems.

**Legal & Policy Updates In The Potato Sub-Sector**

Agricultural growth is fundamental to poverty reduction and food security. Policy reforms and investment play a critical role for agriculture growth through enhancement of an enabling environment; which is key for government in support of investment in agriculture production. The Potato subsector has potential to contribute more to the development of the economy with improved regulations and policy which will boost the current contribution of over Ksh. 50 billion.

Favorable policy in potato industry is important in facilitating the process of producing and availing quality seed potato, improving the production and marketing of ware potato and growth of potato industry as a whole. There has been constant review of Cap 326 (Seed and Plant Varieties Act) to allow for the updating and incorporation of emerging issues and technologies related to the seed subsector. For instance, the relaxing of stringent regulations to allow for the importation of seed potato tubers while enforcing phytosanitary requirements were put in place. The law governing evaluation and release of varieties was also enhanced to allow easier introduction of varieties from other countries in the region. This led to improved production of certified seed potato and increased high-yielding and processing varieties. Additionally, stakeholders in seed industry developed a law to allow authorization of private inspectors in seed certification from KEPHIS. These changes in policy were done to address the initial legal bottlenecks and unlock the opportunities in the value chain through efficient seed certification service delivery.

Ms. Sarah Kuria (formerly NPCK) takes farmers through training on importance of public participation in development of regulations during the South-Rift Region Potato Fair.

**Thousands benefit from a German-funded nutrition sensitive potato partnership project**

Thousands of potato farmers have benefited from a project that aims at diversifying their diets and which is supported by the German development cooperation. The Nutrition-Sensitive Potato Partnership Project (NuSePPP) has trained 3,690 farmers who undergo an intensive 3.5 months’ training course in farms and business schools. Additionally, the project established nutrition community dialogues with a total of 13,605 beneficiaries who are organized by counties and assigned community health volunteers. This has been done in conjunction with the departments of agriculture in the Nyandarua and Bungoma counties, KALRO, NPCK and CIP. NuSePPP aims at improving the dietary diversity of communities

Cooking demonstration in Olkalou during community dialogue session.
in potato growing areas through enhanced nutrition knowledge of the target communities. This is done by disseminating the nutritional knowledge and information and is part of the community health strategy that has been supporting farmer training outreach model with each having 25 farmers. Selected Ward Agricultural Extension Officers (WAOs) are trained by experts from KARLO as trainers-of-trainers (ToTs). The WAOs then go on to train farmers helping to raise production. Indeed, according to a survey conducted in September, production had increased to 12 tons per hectare for 215 respondents as compared to a baseline value of 8.7 tons per hectare.

The power of partnership: GIZ, AgroCares & manufacturers join hands

NuSePPP has entered into partnership with AgroCares to improve soil fertility by availing prompt information to farmers in Kenya.

As a result, potato farmers stand to benefit from information on soil fertility management and how to make informed decisions and through fast, affordable and reliable soil testing services. In addition, the project will endeavor to identify and train the youth to be offering soil-testing services to farmers as well as supporting the development of business plans for potential service providers and linking them to financial and insurance companies.

The other component in the partnership will be on the development of new research-based applications and project impact assessment through data collection on good agricultural practices using standardized and approved training materials. The training at the FFBS takes three-and-a-half months; there are 15 sessions.

Practical sessions

The training includes practical sessions done in well-established demonstration plots. Here, farmers learn about good agricultural practices which they can apply in their farms. From each FFBS, three of the best farmers are selected to become lead farmers in their respective groups. The lead farmers form a school of 15 farmers to undertake similar training. So far, a total of 3,690 farmers have undergone the intensive training. This is Harvest from one of the farmers in FFBS.

The event brought together players in the value-chain to help mechanization service providers discuss and find credible solutions for mechanization potato production in Kenya. A number of companies including Poitinger, Massey Ferguson, New Holland, and Case International not only showcased their tractors and equipment, but also demonstrated them at work to the farmers. More than 700 farmers attended the field day with more than 20 private companies exhibiting their innovations.

The project has in the recent past expanded its operations to two new counties; Trans-Nzoia and Elgeyo Marakwet. The regional office for overseeing and coordinating implementation will be situated at KALRO Kitale. The official inception meetings were conducted during the month of November in the two counties. The actual implementation will commence in January 2019.

By GIZ, NuSePPP Team

Kenya-Netherlands seed potato Development project records success

The partnership between public and private sectors on seed potatoes has come of age. Bringing together Kenya and Dutch governments, facilitated the training of stakeholders in two courses this year. The first course was on storage of seed and ware potatoes while the second was on principles and practices of seed potato production. Held in Nakuru County, both courses were conducted by experts from relevant fields. Targeted were large and medium scale seed potato growers, processors as well as middle and senior managers from counties and NGOs.

It was important to train the stakeholders on storage of seed and ware potatoes because storage is key to potato production. Sound storage of seed potato is needed not only to bridge the period between harvest and next planting season but also to ensure that seed is in the right physiological condition before planting. The project enables the physiological development of seed potatoes to be controlled which results in good growth vigour and high yield potential. There are different options for seed storage depending on climatic conditions, storage period, scale of production and investment levels. Good storage of ware potatoes,
The learners were trained on available storage solutions used in the world today facilitated by the companies Hanse Staalbouw, Omnivent and Tolmsa.

Hanse Staalbouw targets storage needs of small and medium-sized farmers to prevent post-harvest losses and to optimize on efficiency and profit. It uses prefabricated materials with a capacity of 50 tonnes for smallholders which is ventilated by opening the doors at night. It can be tailored to use solar power or electrical power to boost cooling. Potatoes can be stored in 50 kg crates in the store.

Omnivent provides storage solutions for small and medium-scale farmers. It has state-of-the-art equipment to control humidity, temperature and carbon dioxide which enables potatoes to be preserved for as long as nine months. The return on investment with optimal use is 2 seasons. Omnivent Company provides services such as store drawings, manuals, installations and maintenance and can use locally available materials.

Tolsma, on the other hand, is suited for large-scale producers such as the 3,500-tons seed potato store at Agrico East Africa. The design boasts of equipment such as ventilators which reduce rot and moderate air and circulate air as well as humidity and temperature control systems.

The training underscored the importance of the Kenya-Dutch Seed potato project, a public-private partnership that fits well into the strategic directions of the Kenyan and Dutch Governments, in which food security forms one of the central pillars. It also involves the private sector which is crucial for the management and implementation of effective programs. This has resulted in innovative developments such as the breeding and variety development, seed potato production and certification, storage and marketing.

Benefits for the private investor

Opportunities for private sector involvement in the seed potato project include the multiplication and supply of high quality seed potatoes of varieties suitable for different purposes such as fresh markets, processing into crisps, French fries and other uses. Other opportunities are in the supply of inputs such as crop protection chemicals and fertilizers, provision of machinery and equipment for commercial and ware potato production at different scales of production and development of handling and storage facilities at different scales and volume levels.

In addition, there are opportunities in the provision of training on professional use of sophisticated machinery and facilities as well as provision of equipment and support to potato processing including systems for year-round supply of ware potatoes for processing. Further, there are opportunities in all areas of the potato value chain including crop management, logistics, transport and marketing and in providing support to government programs related to phytosanitary services, food safety and environmental issues.

By Emily Osena-Network Facilitator - Kenya Netherlands Seed Potato Development Project.
Egerton University joins other stakeholders to educate farmers in Nakuru County

Beneficiaries of the CARP+ project visit a seed potato production unit to learn more on potato production.

Egerton University joined hands with other stakeholders in the potato and irrigation subsectors to train farmers in Nakuru County through a farmer education day commemorated on June 22, this was a timely and crucial initiative of national importance that is promoted by agribusinesses and education institutions. Those involved in the two projects, the Seed Potato Community Action Research Project (or Seed Potato CARP+) and Nakuru Irrigation Acceleration Platform (IAP) used the day’s event to share their experiences and learn from other actors, create business linkages among farmers and actors and lobby for more support to the two sectors.

The objective of the education platform was to facilitate joint learning, deepen collaboration, broker business deals and enhance public-private partnerships in the irrigated cropping systems. Over 320 farmers and 20 exhibitors attended the event. Kishiti Farmers CBO educated farmers on how to select clean seed potato.

The event showed that joint action by different stakeholders goes a long way in planning and funding projects. The projects will continue to build on this commitment and mutual benefit by IAP members to organize future events.

In addition, NPCCK conducted two training sessions on potato production and market linkage during which some farmers were linked to new markets. Among the beneficiaries was Elijah Chesire, a service provider for Kolket Ndarugu Irrigation Community-based Organisation. Chesire was introduced to Twiga Foods, a company that buys potatoes in kilograms, which is preferred by farmers as they get a fair return for their produce.

Twiga Foods first paid a visit to his farm and scheduled the harvesting. During the harvest day, the company brought its graders who met Chesire and his team of harvesters. In total, he sold 2.8 tons at Ksh30 per kilo. He was paid via MPESA before he sold 2.8 tons at Ksh30 per kilo.

He was paid via MPESA before selling 2.8 tons at Ksh30 per kilo. Chesire expressed satisfaction with the new partnership with Twiga foods that was brokered during the NPCCK seminar. He has now scheduled the production of other crops in the coming dry season.

At the end of the exhibition, a Nakuru County Potato stakeholder’s forum was convened by Dr. Immaculate Maina, the County’s Executive in-charge of Agriculture, Livestock and Fisheries. The Forum is aimed at mapping out all sector players, what activities they are involved in, and what they needed. It was agreed that the stakeholder’s will fast track the development of the training modules for farmers; the marketing study on potato varieties, and improved coordination among actors in the potato sector.

Based on the multi-stakeholder collaboration and good will, the Nakuru IAP has planned to hold five additional field days between 2018 and 2019. Egerton University plans to expand the demonstration site so that it can be used during students’ and farmers’ experiential learning sessions. At the same time, the County Government of Nakuru will be spearheading the establishment of 45 potato demonstration sites that will be used for learning purposes.

Mr. Henry Chemjor - NPCK take farmers through the Viazi soko platform during the Cropping and Irrigation Systems field day.

The activities underscored the importance of unlocking Kenya’s agricultural potential which is a key priority in the country. There is need to create awareness of available technologies, market linkages, innovative financial products and services and undertake policy and institutional reforms to realize this potential. To this end, the Crops, Horticulture and Soils department and Division of Research and Extension at Egerton University are implementing two projects that are meant to transform the seed potato and irrigation value chains by putting smallholder farmers at the Centre for development initiatives in Nakuru County.

CARP+ is funded by Master Card Foundation through RUFORUM while IAP is funded by SNV–Netherlands Development Organization. These two projects are under the leadership of Prof. Antony Kibe.

Yes, our potato output is low but we can do better

"What I say is that if a man really likes potatoes, he must be a pretty decent sort of fellow."
—A. A. Milne, English writer (1882–1956)

Potato is the second most important staple crop grown in Kenya, after maize, and before rice. Potatoes are extremely good for us! The tubers are fat, sodium & cholesterol free and packed with protein, slow release carbohydrates, vitamins and minerals, not to mention health-promoting phytonutrients. Potato (whose botanical name is Solanum tuberosum) is a major food crop grown in more than 100 countries in the world. Global as well as local demand is rising due to rapid urbanization that has created a growing middleclass, and the increasing appeal for fast foods such as crisps and French fries. Global potato production has risen steadily over the years from 267 million metric tons in 1990 to 377 million metric tons in 2016. China is the largest producer of potatoes in the world. Only about 50% of potatoes are used fresh for cooking at home – the rest are used in processing.

In Kenya, potatoes are generally grown in the higher altitude areas in 15 counties. This is done basically on rain-fed farms where the crop competes favorably with maize production. As many as 800,000 people in Kenya directly benefit from potato production with the crop providing a source of income for over 2.5 million people employed across the value
production since the total national production has remained steady or declined, with much lower yields per hectare being realized now than in 2004 and 2007. Data from the Food & Agricultural Organization shows that average yields are sitting at less than 14 metric tons/ha although the potential should be more than 20-40 metric tons/ha.

Thus, as a country we could potentially make more than double our yields, without increasing the land area under the crop. This would go a long way to improve GDP and food security, and help achieve our national development goals enshrined in the Big Four Agenda and Vision 2030. Globally, raising potato productivity can positively contribute to the Global Feeding 50 billion goal.

**Soil health**

The first step in addressing this situation is for farmers to find out the health status of their soil. A complete soil analysis will give the farmer a scientifically-based recommendation on amount of lime, dolomitic lime, organic matter and phosphate required in the soil so as to increase its fertility and to bring the pH and nutrients into suitable levels.

This results in better soil structure, higher yields, better quality and disease resistance, longer storing tubers and better soil health for long-term sustainable agriculture.

This does not necessarily mean incurring additional cost since the money spent on soil amendments is offset by chemical and fertilizer costs. The higher yields the farmer gets results in a higher net profit, not to mention better environmental husbandry and a higher nutrient content in the tubers.

**Effects of infertile soils**

The year-in, year-out growing of potatoes on the same soil using the same fertilizer program and soil preparation methods with no consideration to the chemical balance in the soil and the crop take off, has resulted in the relevant soils developing low pH and calcium levels, low phosphorous levels and a break down in soil structure and inherent biodiversity. Bad soil structure reduces root penetration and water infiltration into the soil and makes it susceptible to flash flooding and soil erosion during the rains, and drying of the crop during dry weather.

**Low soil pH reduces efficiency of nutrient uptake.**

Whenever the soil pH reduces, adding more fertilizer does not help; indeed, it perpetuates the downward spiral of pH level. Low fertilizer efficiency can mean either that farmers use the same amount of fertilizer but get lower yields or that they use more fertilizer to maintain the same yield. This results in either increased input costs or reduced production which then leads to reduction in income. Calcium and soil pH tend to go hand-in-hand with low pH indicating low calcium and often low magnesium. Potatoes have a relatively high magnesium and calcium demand – and these elements are removed from the soil in the tubers at harvest. Very often they are not replenished even though their levels in the soil reduce. It is important to note that magnesium and calcium are most important for soil pH, soil structure and microbial diversity. For instance, magnesium is used for photosynthesis and is a plant energy and yield driver while calcium is important for disease resistance, tuber quality and shelf life. Low calcium leads to more diseases, more pesticide use, lower yield and quality and a short shelf life.

**What is causing the reduction in yields?**

What can we, as farmers and stakeholders in the potato subsector, do to alter the prevailing potato production trends?

*Photo Credit: Ken Fletcher*

**A Potato field devastated by PCN.**

The Crop nut team poses for a photo to showcase soil sampling.

Now offering following ISO 17025 Accredited Analysis:
- Ralstnia testing
- Complete Soil Analysis
- Potato Cyst Nematode Analysis
- Irrigation Water Analysis

**The Chips are down, get them up again.**

Solveig Haukeland from ICIPE, according to an article submitted to FAO in March 2018 by Dr. Solveig Haukeland from ICIPE, PCN infection is widespread in the country’s potato growing areas.

When 1236 soil samples were taken from fields in 20 potato growing areas and tested, an average of 82% of the soils tested positive for the PCN (Globodera rostochiensis) and most worryingly one sample was infected with Globodera pallida. Regional infection rates varied from the lowest, 53% in Bomet, to 100% in Trans-Nzoia, Taita Taveta and West Pokot. Potentially, PCN can massively reduce yields by as much as 80% and its therefore no coincidence that yields have been dropping across the country!

**What to do**

To reduce the impact of PCN, farmers are strongly advised to test their soils to know the soil population of the nematodes. PCN cysts persist in the soil for up to 20 years – but the higher the population at the start of your crop cycle the higher the damage to the crop.

Apart from soil testing, crop rotation is very important in managing PCN. This is because PCN levels build up in the soil where potatoes are planted. The highest levels of PCN and the highest crop damage are seen on soils that are cropped twice a year with potatoes. Even one break crop can reduce levels, but ideally potatoes should be grown in (a 4-year rotation system with other crops).

It is important to purchase certified seed potato. However, this may not be possible in many parts of Kenya where the demand for certified seed is far higher than the production!

Additionally, farmers are advised to check potato seed for infection and discard infected seed in a deep hole; wash and disinfect tractors and other equipment (such as spades, boots, bucket etc.) to remove soil and PCN cysts.

The waste water should be put in a drum and boiled or be drained in a pit where it can be treated before discharging in a deep hole within the farm.

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Ghana

I am not a farmer.

16 | National Potato Council of Kenya

National Potato Council of Kenya 17
A farmer should dig a deep hole at the corner of his infected farm and dispose all infected materials and treated infected water there. Further, it is important to avoid cross movement of animals and people through the fields as much as possible; and to plant PCN-tolerant varieties if available.

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- High Concentration of carbon
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**KNOWING THE DISEASES**

The problem of increasing levels of PCN in soils is compounded by an upsurge of infectious diseases. Some, like late and early blight can be treated with fungicides. Others like Ralstonia (bacterial wilt) can kill plants and can greatly reduce crop yields. Interestingly, Ralstonia can be present and express no visible symptoms in crops growing in colder wetter growing regions. Wilting followed by plant death can quickly come in hotter weather and water stressed plants.

It is important for farmers to know if their soil, water or plant materials are infected and to what extent before planting. Like PCN, ralstonia is very persistent and the only defense that farmers have include long term crop rotations with plants that are not from the solanaceae family; good farm hygiene practices, and monitoring the disease levels in plants, soil and water via laboratory testing as symptoms in growing plants can be absent or confused with other problems.

**Tips on how to secure high potato yields**

Agrico East Africa prides itself with producing high-quality, certified seeds potato from The Netherlands. We import our seeds from The Netherlands to Kenya and multiply them in our farm in Nakuru. For instance, we planted 150 acres of potatoes for both seed and consumption in 2018.

After certification by KEPHIS, our seeds are then sold to farmers across Kenya. Certified seeds are the most important determinant of how much you harvest and the characteristics of your potatoes. However, good farming practices, use of the right fertilizers, adoption of a spray regime and conducive weather also play an important role.

**Kenya’s potential**

Kenya has the potential to move away from being a net importer to a net exporter of potatoes through due diligence, testing and monitoring, identifying the correct inputs and access to finance and certified seed as well as use of the correct farm inputs.

Lack of access to the correct farm inputs and certified seed is another stumbling block to raising potato yields in the country. To address this, CropNuts, a leading Kenyan laboratory, has developed an online farm inputs directory to link farmers to suppliers for the purpose of sourcing the correct inputs. This also enables farmers to shop around for better prices through the shambaza.com.

As shown in the chart above, the uptake of major nutrients is greatly affected by soil pH. At a pH level of 4.5, the uptake of phosphorous is reduced to less than a quarter which means that for the same result, the farmer needs to apply 4 times as much fertilizer. Soil samples of pH levels less than 3.6 are often picked by soil testing companies!

A farmer should dig a deep hole at the corner of his infected farm and dispose all infected materials and treated infected water there. Further, it is important to avoid cross movement of animals and people through the fields as much as possible; and to plant PCN-tolerant varieties if available.

At CropNuts, we are proudly Kenyan and supportive of Kenyan Farmers. We have developed a special discounted package for smallholder potato farmers to analyze their soil fertility, nematode and disease levels, and get science-based advice. In some areas, we have seen two-three fold increase in yields after fertility adjustment alone!

Please contact us on support@cropnuts.com and ask for more details (remember to mention NPCK in your enquiry email, to get a discount).

By Ruth Vaughan

Technical Director,

CropNuts
In addition, it is useful to check the pH level of the field and to test the soil every 2-3 years. The pH plays a significant role in the availability of microelements. The recommended pH level for potatoes is 6.2.

Nowadays, soil tests are affordable, widely available and very fast; some companies even come to your farm to take the soil sample, test with a handheld device on-site and give you the results in 10 minutes! Knowing which nutrients are already in the soils and which ones need to be added can help you save money and increase your yields. The required amount of nutrients and fertilizers depends on expected crop, available potash in the soil, and weather conditions. Agrico EA can review the fertilizer program after farmers have done soil testing and purchased our certified seeds to advise farmers on the best variety.

Prepare the land well before planting

You need to prepare the soil before planting in a way that will give you about 28-30 centimeters of loose ground. Potato needs 30 centimeters of loose soil to grow well and give you good yields. When you want to prepare your land mechanically, we suggest a horizontal working rotator. If you are using a tractor for planting, go for one with narrow wheels to reduce compaction of the soils and loss of valuable soils that cling to the tire tracks.

It is good to grade the seeds into several sizes. In Kenya, there are two seed sizes: size 1 which is 28-45 millimeters and size 2 is 45-60 millimeters. Try to work properly with the row-distances of 1 foot and between the rows. It makes the ridging much easier. Place the seed on top of the cultivated ground and make a little ridge above it. It is important that all seeds are planted at the same depth.

If you are not able to get enough loose soil for the seeds to be planted on 30 cm of loose ground, then make hills or ridges first, and plant your seed on top of the ridge, about 1 finger deep. This way, the ridge will give the potato enough loose soil for good ‘tuberization’ (i.e. raise the number of tubers) and for the tubers to grow big in size. Do not plant in the furrows or valleys if you do not have at least 25 cm of loose soil beneath your planting level. It is more work to first make hills and plant in them, but it will pay off in increased yields.

Want to learn more about good potato farming? Follow us on Facebook. Our page is called Agrico EA, and/or send an email to info@agrico.co.ke to get our free Potato Growing Guide that has instructions on all phases of potato growing. You can call us on 0741-788 380 (for those in or close to Nakuru) or 0722-206 179 (for those close to Nairobi) to place your orders and very fast; some affordable, widely available nutrients are already in the soils and which ones need to be added can help you save money and increase your yields. The required amount of nutrients and fertilizers depends on expected crop, available potash in the soil, and weather conditions. Agrico EA can review the fertilizer program after farmers have done soil testing and purchased our certified seeds to advise farmers on the best variety.

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By Corien Herweijer.

Testimonial

“Using certified seeds is key to achieving optimum potato production. As an agronomist consultant, I have managed to a number of farmer groups from Isei Cooperative in Bomet, Mau-Narakon and Nakuru on intensive potato production. Markies potato variety seeds from Agrico EA were used and after following good management practices including soil testing, good land preparation, proper planting techniques, pest and disease control, the variety showed good performance as it resulted to yields of 14 tons per acre. Currently, most of the farmers who benefited from the training are now reaping benefits after applying the skills they learned.”

Alex Ng'etich, Agronomist Consultant based in South Rift.
Farmers and traders can store opportunity in potato storage. Supply windows present a business characterised by high supply to July to September and in January year as they are harvested from June to November. As a result, potatoes supply is lower during the peak harvest season. Therefore, storage is estimated to be 9,000 metric tons; 80% of this capacity is utilised for storage of seed potato. This is understandably so because seed potatoes which are produced at the same time as ware potatoes, need to be stored for three to six months before being planted in the following rainy season. Seed potato also fetches relatively higher margins and is considered more profitable.

It is important to mention that potato in Kenya is grown during the main rainfall seasons. Kenya experiences two rainfall seasons; the long rains falling from March to June and short rains from October to December. It is financed by The Netherlands Development Organization.

SNV-Netherlands found out that size and technology of storage depends on the storage period. For purposes of exploiting market prices, storage in Kenya is guided by the period of high supply that ranges from two to three months. Storing ware potatoes for three months involves technology that will maintain the potatoes at temperatures of between 11°C and 15°C with constant air circulation within the store.

The solutions to this problem periods extending up to 2 months shut-down their operations for November to January, some are forced to completely cease operations. Processors and restaurants because it is always cheaper to produce with the rains. In addition, the average price of potatoes is generally lower during the peak harvest season, and stability of supply is better guaranteed for potatoes already in storage.

All these considerations raise the question on whether it is worth it to invest in potato storage facilities in Kenya, or should one go for irrigation. I will argue that storage is an ideal choice for processors, restaurant chains and traders because it is always cheaper to produce with the rains. In addition, the average price of potatoes is generally lower during the peak harvest season, and stability of supply is better guaranteed for potatoes already in storage.

The solutions to this problem is to inform the industry on feasibility of commercial storage for ware potato. SNV-Netherlands Development Organization is an international development organization implementing the Kenya Market-Led Horticulture Program that is financed by The Netherlands Government.

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A low cost ambient potato store.

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Potatoes are mainly grown on different soils from sandy loam to clay loams with good drainage and good aeration. Being a sensitive crop, it is very important to take precautionary measures prior to planting potatoes. Testing the soil before planting will help a farmer to detect any pH (levels of alkalinity or acidity) variations, nutrient deficiencies and possible diseases in the soil. On average, the crop does well in soils with a pH of between 5.5 to 7.0. High pH strongly impacts on the availability of certain nutrients.

However, most soils in Kenya have low pH owing to long usage of phosphate fertilizer and their inherent nature. They are also usually deficient in Sulphur and boron. Potatoes need different nutrients throughout their growth cycle. When the crop is young, it is important to feed it with phosphate which promotes rapid canopy development, root cell division, tuber set, and starch synthesis. As the crop progresses towards bulking stage, it becomes necessary to apply potash fertilizer so as to boost yields and quality as well as the general health and vigor of the crop. Farmers are advised to supply these nutrients in split dosage and at the required timing. This means applying fertilizer with a good balance of NPK+Te elements at planting time and a fertilizer heavy in potash at top-dressing time.

It has been noted that proper balance of primary nutrients as well as secondary nutrients is paramount for potato cultivation. Ongoing research funded by the government, NGOs and private companies in major potato-growing areas such as Nakuru, Meru and Nyandarua seeks to establish the importance of balanced nutrition in potato farming. Farmers are brought on board in the research and trained on soil testing, potato nutrition, liming, use of certified/clean seed and correct application of chemicals. Following this, they have seen improvements in yields of up to 15 metric tons/acre as opposed to between 5-10 metric tons/acre which is the norm. Besides this, it has been noted that farmers who can also achieve optimum tuber size and weight, quality produce, good flavor and color fruit and realize produce that can be stored for a longer time.

When this is combined with good crop husbandry including addressing common diseases such as early blight, viruses and controlling aphids and nematodes, it will definitely lead to improved yields and see the country improve potato yields as desired in the government’s Big Four Agenda.

Potato is the world’s fourth most important food crop after wheat, maize and rice. It is the second most important crop in Kenya after maize. Globally, potato is grown successfully in tropical and subtropical climates, with about 100 out of 140 potato growing countries being located within the tropics and sub-tropical regions. Potato is expected to play a pivotal role in food security.

Availability of certified seed is low at less than 4% and farmers resort to uncertified planting materials. This has resulted in proliferation of diseases, mainly bacterial wilt, viral diseases and nematodes, which has further compounded the problem. Over the last 5 years, the government has put in place measures to increase availability of certified seed potato.

This includes the scheme aimed at increasing production through variety evaluation and release. This is done by KEPHIS, in collaboration with local and international potato breeders. In the recent past, KEPHIS has made considerable progress in availing high yielding, market oriented varieties that farmers can take advantage to satisfy market requirements. New varieties of potato are approved for commercialization only after undergoing tests related to their adaptability and suitability for cultivation under the growing conditions in Kenya. The process of testing new varieties is guided by the Seeds and Plant Varieties Act (Cap 336) of the laws of Kenya. The local and international breeders have done tremendous work in developing high-yielding and market responsive varieties that are currently being multiplied.

Testing of varieties

The technical evaluation for agronomic performance is done using two approaches: Conventional NPT and Intensive NPT. The first one is the rain-fed, conventional agronomic practices while the Intensive NPT requires the use of high input management under irrigation with intensive control of pests and diseases. The latter targets varieties for farmers with mechanized systems. Yields of over 60 tons per hectare have been achieved under this system as compared to 40 tons/ha under conventional system.

NPT testing is undertaken at 10 sites, representing potato-growing areas of Kenya. Six sites are for conventional, while 4 are for intensive NPT. Conventional NPT sites include Timau and Kiborriana (Meru), Kamai (Nyandarua), Narok, Burnt Forest (Uasin Gishu) and Cherangany (Trans Nzoia). On the other hand, Intensive NPT sites include Mau Narok and Molo (Nakuru), Oljnorok (Nyandarua) and Timau.

Significant progress has been made since 2012 after the signing of MOU with The Netherlands that has seen evaluation and release of many potato varieties. A total of 61 potato varieties have been officially released in Kenya. These include varieties developed by Kenyan breeders, Netherlands and Scotland. Kenya has also signed an MOU on importation of potato tubers from France and Scotland and additional potato varieties are expected from these countries.

These developments have made it possible for Kenyan potato farmers to have a substantial number of varieties to choose from in response to the market demand. The varieties released are suitable for processing as well as table use. Evaluation of...
more varieties sourced locally and internationally is in progress.

**Seed multiplication**

Official release of varieties has set the stage for their multiplication, that leads to consistent supply of certified seed. KEPHIS has put in place measures to ensure that farmers get high quality and disease-free seeds of these varieties.

Traditionally, seed potato production in Kenya has been undertaken by public institutions. However, recent developments have seen the entry of private seed producers. Currently, there are 15 registered seed companies dealing with seed potato in the country. These include ADC, KALRO Seed Unit, Kisima Farm, Suera Ltd, Charvi Ltd, Sungus Enterprises, Gene Biotech, East Africa Seed Co, Syngenta (EA) Ltd, Agrico (EA) Ltd, Kevian, Seeds 2B, GTIL (Minitubers and Apical Cuttings), Stokman Rozen (Apical Cuttings) and Sigen Hortipruce. All seed potato registered by these companies are inspected and certified by KEPHIS.

**Some initiatives in seed potato production**

Initially, seed potato multiplication was undertaken only by the Agricultural Development Corporation (ADC), who would obtain breeder’s seed from KARI (now KALRO) Tigoni. However, in recent times players from the private sector have invested in seed multiplication. These players produce seed directly and through out-growers. The following are some of the initiatives:

**Support for small-scale seed growers.**

From 2005 to 2008, KEPHIS facilitated a special arrangement where KARI (now KALRO) Seed Unit supported farmers to use its license in having their seed crops certified in collaboration with the Ministry of Agriculture Livestock and Fisheries (MOALF). Similar arrangements have been made with other registered seed companies. These special arrangements have been very instrumental in supporting small scale growers, who may not afford to register seed companies and therefore make a contribution in increasing availability of certified seed as well as availing seed at close proximity to the farmers.

**Importation of Seed Potato**

The first importation of potato tubers from the Netherlands was done in 2012. This followed the signing of a bilateral agreement between Kenya and the Netherlands on the importation of seed potato. So far close to 1,500 tons of seed potato have been imported. The seed is multiplied locally before distribution to farmers to assure that they are free from pests and diseases in the first growing season. This has helped increase the volumes of seed potato available to the farming community. It has also resulted in availability of potato varieties for diverse use such as processing (chips and crisps) and for table use. Other agreements have been signed with France and Scotland; importation of seed potato from these countries will happen in the near future.
Mini-tubers and Apical Cuttings

Use of mini-tubers has been employed to produce disease-free starter planting material for production of basic seed. Recent research has demonstrated that apical cuttings can be used as a source of disease-free planting materials. Plants obtained from tissue culture are used to obtain rooted cuttings, which are hardened and planted directly. This is a quick method of obtaining large amounts of planting materials within a short time. KEPHIS has already developed seed certification protocols for mini-tubers and apical cuttings. The method can also be very useful in increasing the availability of potato basic seeds.

True Potato Seed

True Potato Seed (TPS) is a lower risk material than seed tubers with regard to spread of diseases. However, TPS has the challenge of varietal uniformity. Recent research has resulted in varieties with considerable uniformity and these hold a promise in contributing towards increased seed potato production.

‘Cluster farmer’ seed production

This model involves groups of farmers in a particular locality growing seed that are inspected at the same time. This is advantageous as it helps reduce the costs of inspection since many farmers are visited at the same time. This model also makes training easy and cost friendly. Furthermore, farmers organized in groups find it relatively easier to obtain funding compared to individual farmers. In some cases, such farmers are organized in co-operative societies. The model has been very successful in production of seed of pulses and holds much promise in increasing certified seed potato production.

By Dr. Esther Kimani, Managing Director, Kenya Plant Health Inspectorate Service.

NPCK Targets thousands of farmers in collective input sourcing

Low potato productivity and poor quality are mainly as a result of low access and use of inappropriate inputs such as low quality seed potato, inappropriate fertilizers as well as pesticides. When this combined with poor pre-and-post-harvest practices, the end result is lower production and inability to reap full benefits of potato farming.

NPCK acknowledges these challenges and has made moves to address them. One of NPCK’s initiatives has been to support farmers to improve potato productivity and incomes by organizing them into groups and cooperatives with the goal of collective input sourcing and marketing of produce.

Towards this end, NPCK has supported 16 farmer groups to collectively access various services such as, finance and insurance, soil testing and access to certified seed at subsidized rates. The Council has also linked the farmer groups to Market outlets.

By Henry Chemjor,
Value Chain - NPCK

The role of potatoes in the attainment of the Big-Four Agenda

Currently, the Government of Kenya is pursuing a development agenda based on four priority pillars (or the Big Four) which include the achievement of 100 percent food and nutrition security for all Kenyans, universal health care, affordable housing and the promotion of the manufacturing sector. The State Department for Crops Development has prioritized Irish potato as one of the major crops to achieve the nutrition and food security target.

The department has identified, as a strategic objective, the increase in annual potato production from the current 1.2 million metric tons to 4.5 million metric tons by June 2019. To achieve this, it has set up a number of targets which include increase in production of basic potato seeds from the current 186 metric tons to 459 metric tons within the pilot phase year of 2018/19. In addition, it seeks an increase in the production and supply of certified seed potato from the current 6,375 metric tons to 17,946 tons and to develop 12 potato aggregation centers with appropriate potato handling facilities.

Besides this, the department intends to support the establishment of ware and seed potato infrastructure and especially two cold stores, 12 ambient stores and 81 diffuse light stores through public-private partnerships. Lastly it seeks to expand irrigated land under Irish potatoes.

To achieve these objectives, the department has put in place strategic partnerships with other government ministries, state agencies, public universities and private sector as well as NGOs within the 2018/19 period.

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This is being implemented in three phases in 12 potato growing counties. In the first phase, 22 farmer groups and cooperatives, with about 10,000 farmers and a total acreage of 5,000 acres, will be supported in the coming one-and-half years.

During the second phase, NPCK will support 92 farmer groups/ cooperatives with about 25,000 farmers farming on about 12,000 acres over a 3-year period. In the third phase, the Council targets to reach out to 220 farmer groups and cooperatives with approximately 100,000 farmers with 50,000 acres of land over five years. This is mainly aimed at enabling farmers to increase yields, income and improve their livelihoods.

By Henry Chemjor,
Value Chain - NPCK

Shortage of seed potato springs up opportunities

Originally published in the Seeds of Gold (Saturday Nation - October 6, 2018)

In Summary

• The use of farm-saved seeds, which is the common practice throughout the country, comes with many challenges.
• Samuel Kibet Sugut is one of the more than 200 farmers who have been trained by CIP while working with the county governments in the North Rift and Meru counties to multiply disease-free potato planting materials for local distribution.
• Farmers get a chance to multiply clean seed which they can sell to others for at least Ksh. 2,500 for a 50 kg bag.
• In the North Rift, farmers multiplying the seeds have focused on Shangi, Unica; which is a new high-yielding and drought-tolerant variety from Peru and the Dutch Robijn; which is ideal for processing.

In the quiet Kipsirigo village in Nandi County, a new agribusiness is picking up.

Samuel Kibet Sugut is among the farmers who have embraced a new agribusiness, which involves the multiplication of Irish potato planting materials, having abandoned dairy farming to concentrate on what is turning out to be a cash cow. Sugut, who was a dairy farmer for 15 years, has seen a bright future in the production of the disease-free materials that many farmers are turning to.

Compliantly published in Seeds of Gold (Saturday Nation - October 6, 2018)
**Meet Salome Mwangi, a potato farmer who’s fortune has changed dramatically**

Salome Mwangi is a potato farmer whose fortune changed dramatically after she started cultivating clean seed potato. Salome made her first million shillings in 2016.

This was after planting clean seed potato on a 3-acre piece of land from where she harvested 350 bags. Selling each at Ksh. 3,000, Salome made a whopping Ksh. 1,000,000. Following this, the evidently happy woman is now contracted by the Agriculture Ministry to supply it with seed potato.

But things have not always been like this for Salome. Previously, she used to plant potatoes on a quarter-acre piece of land which produced a mere 8 bags. This was before she joined a project that promotes economic wellbeing of women. Doubled Accelerating Rural Women’s Access to Agricultural Markets and Trade, the project caters for women livelihoods by assisting them to raise agricultural production for the market.

Salome has since parted ways with poverty. Her journey to better living standards began in 2013 when she became a member of the Nyota New Women Group. This enabled her to be trained on best farming practices after which she went on to set aside one acre for potato production in 2015. This paid off; Salome harvested 40 bags which further encouraged the woman who hails from Nyota location of Kuresoi North Sub County in Nakuru, to raise the acreage under potatoes.

Indeed, in the following year, she devoted some two acres to potato cultivation and harvested 100 bags. Selling the crop at Ksh. 300 a bag, Salome earned Ksh. 300,000 in the process. Her fortunes was to increase tremendously later that year after she planted 3-acres of clean seed. She harvested 350 bags at the close of the season and made her first million. With such a record of success, it was easy for Salome to earn the seed-growing contract from the Ministry of Agriculture in Nakuru. Salome is grateful to GROOTS Kenya which has been implementing the project since 2013. The project is supported by the Japan Social Development Fund (JSDF) through the World Bank, Kenya country office. It is aimed at enhancing the livelihoods, economic well-being of rural women and markets and trade. The project caters for women livelihoods through enhanced agricultural production and access to markets. The project seeks to equip women with the requisite knowledge and skills, including improving their leadership and organizational capabilities, to enable them to become drivers of their own social and economic transformation.

The project targeted farmers in the dairy, poultry and horticulture value chains in Nakuru and Kitui. As demonstrated by Salome’s story, the project has contributed to women’s economic empowerment and the transformation of the agriculture sector and households’ economies.

Other support that led to this success included training on how to organise farmer groups, facilitating access to affordable loans, advocacy for improved infrastructure and collaboration with the government for improved extension services. This also entailed training through on good production practices and agribusiness as well as facilitating their access to markets and organizing forums for dialogues on gender balance.

By Purity Mburo-Groots Kenya

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**Value Chain Development (AVCD) Project, a US government food security initiative in Kenya.**

“Most potato farmers in the country have been planting inferior seeds, which are mainly leftovers from their harvests, and because of this, the yields have been very poor in terms of quality and quantity,” said Nancy Chebi, the O’Lessor Ward Agricultural Officer in Nandi County. The use of farm-saved seeds, which is the common practice throughout the country, comes with many challenges.

“Some of them have bacterial seed-borne diseases, others viral or fungal such as late blight,” said Dr. Borus.

**Ideal site**

The seed multipliers then carefully transport the cuttings to their farms. The ideal site for planting the cuttings must be where there is no potato or any other crop in the potato family that has been planted over the last four seasons. This is to ensure that the place is disease-free, according to Borus. In addition, all the tools that are used for planting must first be disinfected. The seed multipliers are advised to plant tubers from the first harvest for only two more seasons, and the third generation can now be sold as seeds to farmers.

Sugut sells a 50 kg bag of potato seeds at between Ksh. 2,500 and Ksh. 3,000 depending on demand, which is much higher than what farmers sell a 100kg bag of potatoes.

“A and the price does not fluctuate, which makes the business very attractive and profitable,” he says. Despite the crop being cultivated widely, nearly 95 per cent of potato farmers do not have easy access to clean planting materials which calls for investment in seed potato production. Dr. Borus says that before getting into potato seed multiplication, one needs training after which they have the initial capital to buy the cuttings, farm inputs and to construct a seed potato storage facility.

A happy Salome Mwangi.

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**Worthy investment**

“This is a new agribusiness for me, which in the last two-and-a-half years has proved to be a worthy investment,” says the farmer, who sold three of his dairy cattle in 2016 to raise capital for the informal seed potato production using rooted apical cuttings.

Dr. Dinah Borus, an agronomist and the North Rift Field Coordinator with International Potato Centre (CIP) explains that an apical cutting is similar to a nursery-grown seedling except that it is produced through vegetative means and does not originate from a seed.

Sugut is one of the more than 200 farmers who have been trained by CIP while working with the county governments in the North Rift and Meru counties to multiply disease-free potato planting materials for local distribution. The initiative is supported by the Feed the Future Accelerated Value Chain Development (AVCD) Project, a US government food security initiative in Kenya.

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**Meet Sammy Sugut, a potato farmer in Nakuru.**

As he prepares his small piece of land for planting, his phone keeps ringing every few minutes, with nearly all the callers enquiring about the availability of seeds given that the short rain season was just around the corner.

Sugut says that all farmers who planted his clean seeds last season realized more than a double harvest compared to what they usually get from on-farm recycled tubers, the reason why the appetite for more clean planting materials is high.

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**Sources of commercial cuttings**

So far, there are only two main centres in Kenya that produce certified disease-free rooted apical cuttings commercially, according to CIP, they can only meet up to five per cent of the farmers’ demand across the country. In addition, owing to the vast distances (for example from Nandi County to the nearest seed producing centre, which is Agricultural Development Cooperation in Molo), many farmers have never had a chance to plant certified seed in their lifetime.

“This is what informed our project, through which we started producing apical cuttings using tissue culture technology in laboratories. Since 2016, we have trained several farmers from Nandi, Elgeyo Marakwet, Uasin Gishu and Meru counties in seed multiplication,” says Dr. Borus.

The apical cutting technology is endorsed by the Kenya Plant Health Inspectorate Service (Kephis) and is in process of being incorporated in the seed system as starter materials to produce certified seed potato.

CIP research scientists are working with private companies in Nairobi and Naivasha, which have facilities for tissue culture technology. The companies produce the cuttings and sell them to seed multipliers including selected farmers like Sugut. To do this, desired varieties are identified and the vegetative materials are taken to a laboratory for a tissue culture process, through which cuttings that are similar to the seedlings are produced. The cuttings are then sold to seed multipliers at a cost of between Sh10 to Sh15 each.

**Guide to getting seed potato**

Julius Muchiri of Stokkan Rozen Kenya says that to produce rooted apical cutting, vegetative materials from desired plants are collected and grown within a screen house in a laboratory under sterile conditions in a nutrient culture medium known as cocopeat.

They produce roots, stems and leaves that grow like any other plant. Once ready, they are transferred to the farm, where they are planted respectively just like any other seedling. After three to four months, the rooted cuttings produce up to 15 tubers. The tubers are then harvested and sent to the farmer, and the resultant cutters can further be planted.

For the first season after the apical cutting, each tuber will also produce up to 15 tubers to give the farmer a total of 225 tubers. If the second planting of the tubers is equally successful then the farmer will have some 3,375 tubers which can be sold as seed, and all from just one apical cutting, raised over the three seasons.

By Isaiah Esiipsi
National and County Potato Conference and Trade Fair exhibitors of 2018

National Potato Council of Kenya

The Agricultural Finance Corporation (AFC), a wholly owned Government Development Finance Institution (DFI), was established in 1963 initially as a subsidiary of the Land and Agriculture Bank. In 1969, it was incorporated as a public limited company under the Agricultural Finance Corporation Act. AFC’s mandate is to Regulate, Develop and Promote Crop and Livestock production systems. It is to maintain and produce high quality seeds for farmers and ensure adequate production of the countries seed crop for Agriculture and Food Security. ADC Molo Seed established in 1979 is mandated to produce certified seed potatoes in Kenya.

Contacts: Box 23707 - 20100 Nakuru
Tel: 051-2613118, +254-716920047, +254-738196959
Email: mofa.nakuru@nakuru.go.ke
Website: www.nakuru.go.ke

AICGRO (Agriculture and Food Authority (AFA)) is a state corporation established under the Agriculture and Food Authority Act of 2013. Our mandate is to Regulate, Develop and Promote agricultural production through effective regulation for economic growth.

Contacts: Box 37962 - 00200 Nairobi
Tel: (+254 - 20) 238648/9/R, +2547122-200556, +254734-609944
Email: info@aics.go.ke
Website: www.aics.go.ke

TOYOTA TSUSHO FERTILIZER AFRICA LTD
Toyota Tsusho Fertilizer Africa Ltd, is a fertilizer plant in Eldoret specializing in production of crop and soil specific balanced nutrition fertilizer with an aim of improving agricultural productivity and farmer’s income.

Contacts: PO Box 3398 - 00506 Nairobi, Kenya +254 206917956
Tel: 0721402957.
Email: antrixoffice@gmail.com

Baraka Agricultural College was founded in 1974 to educate and train in Sustainable Agriculture and rural development. Currently we offer a wide range of both long and short courses in various agricultural fields such as sustainable agriculture, livestock and bee keeping. Since this year we have become home growers in potato seed.

Contacts: 20104-00100 Molo
Tel: +254 (725) 777-421.
Email: info@barakaagricollege.ac.ke,
registrar@barakaagricollege.ac.ke

Agriva is a company that provides quality certified seed potatoes to farmers in Kenya and the rest of East Africa. It has been operating since February 2012 and was setup together with AgriCrop the Netherlands. Agriva Kenya now has 13 potato varieties registered on the national list including processing and table varieties.

Contacts: Box 634-00619 Mutuhaiga, Kenya
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Since its inception in 1963, Amiran Kenya Ltd has been a driving force behind the horticulture and floriculture industries in Kenya and throughout East Africa. A part of the Balton Group of companies headquartered in the United Kingdom and spread throughout Africa and Israel, Amiran Kenya provides complete solutions in all of its fields of expertise. From products and services to training and capacity building.

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Fax: +2542036352320207472
Old Airport Nrt Rd, Embakasi

Contact: Box 17947-00500 Nairobi
Tel: 0786198200/0727455956/
0202438872
Email: sales@antrixoffice.com

The international potato center was founded in 1971 as a root and tuber research institution to deliver sustainable solutions to the pressing world problems of hunger, poverty, and the degradation of natural resources. CIP brings the scientific background, technical expertise and implementation experience in areas of breeding and variety release, seed system development, agronomy, markets and nutrition for both potato and sweet potato.

Contacts: Box 25171- 00639 Nairobi
Tel: (254-20) 422-3802
Email: cip-kenya@cip.org

The legal entity representing crop and soil testing."
1. **Crop Nutrition Laboratory Services Ltd. (CRONUTS)** is an innovative, mobile laboratory run by a dedicated vibrant team. CRONUTS provides soil testing, leaf analysis, nematology, seed, and root pathogen diagnosis, water waste and irrigation water analysis. CRONUTS gives recommendations and consultancy for Soil Nutrition, Soil Health, Long Term Soil Fertility, Soil Carbon Sequestration, Plant and Root Health and Water Use Efficiency. Tel: +254 (0)720 639 933, +254 (0) 736 593 933. Email: support@cropnuts.com. Website: http://cropnuts.com. Facebook: https://www.facebook.com/CropnutsAg/

2. **Agri Owl**

3. **Aga Waller**

4. **GROOTS Kenya**

5. **GAFA FOODS**

6. **Hardi Kenya Limited**

7. **Hangzhou Agrochemicals Industries EA Ltd**

8. **Kenya School of Agriculture (KSA)**

9. **Kfs Plant Health Inspectorate Service (KPHIS)**

10. **Kfs Farm Seed Ltd**

11. **ICL Kenya**

12. **KALRO Tigoni is one of the four Centres** under the Horticulture Research Institute (HRI) created under KARI, Act 2013 that established the Kenya Agricultural and Livestock Research Organization. With a national mandate for potato research and development, the role of KALRO Tigoni Centre in coordination and implementation of potato research programs is recognized internationally and is accredited by Pest Control Products Board (PCPB) to conduct pre-registration efficacy trials on new pesticides and by the National Industrial Training Authority (NITA) to provide practical training and capacity building of stakeholders in potato sector.

13. **IPM Potato Group**

14. **International Fertilizer Development Center (IFDC)** is a public international organization that helps improve good security and farmers’ livelihoods in developing countries through research, extension and market development. Tel: 0718 290745. Email: grootsk@grootskenya.org. Website: www.grootskenya.org.

15. **Kenya Plant Health Inspectorate Service (KFS)** is the Government Parastatal responsible for ensuring the quality of agricultural inputs and produce to promote food security and national growth. The Corporation does this through three key areas: seed certification and plant variety protection, post-harvest services and analysis of agricultural inputs and produce through its local and globally accredited laboratories. KFS headquarters is in Karen, Nairobi with regional offices spread across the country and in border points. Tel: 0709891000/0206618000. Email: kephinis@kfs.org. Website: www.kfs.org.
Koppert Kenya is a subsidiary of Koppert B.V. Netherlands—the international market leader in biological crop protection as a tool for integrated pest management (IPM). Established in 2006, Koppert Kenya provides an integrated system consisting of natural, safe solutions including soil & seed enhancement, to increase crop health, resilience and productivity in horticulture and agriculture.

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Lachlan is an Exclusive marketing and distribution agents in East for foreign Principals contracted through market intelligence to promote, position and sell products after technical development and registration, and thereafter to ensure growth, integrity of product origin and continued quality of product and service of distributor.

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Fax: +254 20 2060260
Web: www.griculture.co.ke
E-mail: info@lachlanco.co.ke

Lentera Ltd is a farming technology company offering solutions to climate smart agriculture including organic and specialty fertilizers/Silicon fertilizer for increased tolerance and drought tolerance, PROM organic planting fertilizer (DAP replacement) and Micronutrient mix fertilizers. We are located at Lentera house, Opposite S star meadows, Kagera Road off Kiambu Road.

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E-mail: info@lenterafrica.com
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Mavuno fertilizers are the most trusted fertilizers in Kenya since 2001. All our Fertilizers contain at least 11 balanced nutrients: each granule has mineral elements necessary for optimum plant growth. Our continuous efforts include free training and educating farmers on soil health, crop nutrition underlining on solutions to increase yields, reduce fertilizer application and cost optimisation for the small scale farmer through balanced nutrition.

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E-mail: info@mavunofertilizers.com
Website: www.mavunofertilizers.com

Maia Fertilizers Limited is a private company established in 1970 to supply quality farm espous to farmers for improving crop production and hence accelerate agricultural production in Kenya. Our mission is to supply quality fertilizers in Kenya and in the neighboring countries at affordable prices. We offer fertilizers of all types, customized fertilizer blends. Both organic fertilizer for legume crops and soil fertility management services.

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Syngenta is a global leading agriculture company that helps to improve food security by enabling farmers to utilize available resources better. It provides world class science and innovative crop solutions, is committed to rescuing land from degradation, enhancing biodiversity and revitalizing rural communities. Whether they grow potatoes, cereals, vegetables or coffee, farmers around the world trust Syngenta to help them produce healthy, premium crops and minimize the use of expensive natural resources.

Contacts: +254 7032-00100 Nairobi
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E: syngenta. eastern-africa@syngenta.com
Website: www.syngenta.co.ke

Tinga, East Africa’s largest network of tractors and equipment, is a community mechanization concept that enables farmers to jointly access all farm equipment. Farmers come together either as an NGO, SACCO, Church, Co-operative society or Chama and Tinga provides equipment for farming use at the community level. Farmers can access farm mechanization services through an SMS and Tinga mobile-based application from which they can choose a host of services. We seek to impact the communities by being at the forefront of introducing innovative and value adding mechanization services.

Contacts: Box 4977 – 02000 Nairobi, Mbo Rd,
Tel: 0724 499476
E-mail: info@je-tinga.com

Tinga Chemical Industries Ltd is one of the most established companies in Africa, a market leader and a place where many highly experienced and talented people have chosen to work. We are one of the leading agrochemicals organizations, helping our customers increase their productivity and yields, by manufacturing and distributing high quality chemical, life sciences and customer products.

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+254-20-3942300
Email:info@twiga-chem.com,
customerservice@twiga-chem.com
Website: www.twiga-chem.com

The UAP Old Mutual Group is an integrated financial services provider comprising Falfurrias Microfinance, UAP and Old Mutual. The Group came into being in 2015 following the attainment of a majority shareholding in Falfurrias Microfinance Bank in 2014 and UAP in 2015 by Old Mutual Together we offer financial solutions for insurance, investment, savings and banking.

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Old Mutual:Tel:+254 20 2828900
Faulu:Tel:+254 20 3872903-9

For over 20 years now, Wananchi Sacco LTD has provided Financial Solutions to its members. Specifically under the micro-lending projects, the members’ social economic status has been uplifted. The Sacco is registered under the Ministry of Cooperative Development and marketing and is Licensed by Sacco Societies Regulatory Authority to operate in the whole republic of Kenya.

Contacts: Box 910-10106, Othaya Mobile-0722299265
Email: info@wananchi.co.ke
Website: www.wananchi.co.ke

Wambui is a Agricultural Training Centre located in Nyeri County, 5 Km from Nyeri town and along Nyeri-Nakuru road. The Training Centre was created in 1954 and it has played a major role in the development of both livestock and crop production in the country and beyond. The main agricultural activities/enterprises include Livestock- Dairy cows and dairy goats. Crops- Seed bulking on Potato, rice, sweet potatoes and cassava. Others include horticultural and fodder crops.
VIAZI SOKO: A Digital marketing platform for seed and ware potatoes

ABOUT THE PLATFORM
It enables farmers to:
- Query and receive feedback on seed potato information.
- Market potatoes.
- Get frequent advisory message from NPCK and partners.

HOW TO QUERY FOR SEED POTATO INFORMATION
1. Go to your mobile phone messaging service, type: NPCK #REGISTER#Your Name #Your County and send to 22384

   EXAMPLE: NPCK #REGISTER#Peter Kamau #NAKURU

   Note: ● There is a space between NPCK and the first #.
   ● Use at least two of your names separated by a space.

Alternatively you can use the following in place of ‘register’:
- REG, JOIN, JIUNGE ANDIKISHA, INGIA or SHIRIKI.

   EXAMPLE: NPCK #ANDIKISHFESTER KAMAU #NAKURU

2. You will receive a feedback that will include details of: Seed variety, if seed is certified or an alternative, seed size, amount available in Kgs, price per Kg, seed producing company, its contact number and County.

HOW TO MARKET WARE POTATO
To market through the platform a farmer should be in a group that has an MOU/AGREEMENT with NPCK. The group will have a farmer coordinator who will market on behalf of the members. However, farmers who attain a production of more than 10 tons per season can market individually through the system.

1. When a group member is about to harvest, the farmer coordinator will be responsible for uploading the required information as below;

   NPCK #MARKET#POTATO VARIETY #PRICE PER KG#AVAILABLE KG#DAY#MONTH

   send to 22384

   EXAMPLE: NPCK #MARKET#SHANGI#500#15#5

   Note: ● There is a space between NPCK and the first #.
   ● DAY means the harvesting date from 1st to 31st.
   ● Month means harvesting month from 1-12.

2. The coordinator will receive a reply that the group’s stock record has been created and will be valid for a period of two weeks.

   This record is made available to registered potato buyers on the Viazi solo platform who can then place an order for the potatoes.

3. Upon an order placement, the coordinator collects potatoes from the selling members and updates the quantities and prices per Kg in the connected farmer software.

   4. The members involved will receive a digital receipt with transaction details and there after M-pesa payment.

   For more details on requirements and procedure contact NPCK marketing department through Phone: 0799738576/0712338633 Email: npck@npck.org

FOR MORE DETAILS ON REQUIREMENTS AND PROCEDURE CONTACT NPCK MARKETING DEPARTMENT THROUGH:
Phone: 0799738576/0712338633
Email: npck@npck.org

Note:
● There is a space between NPCK and the first #.
● There is a space between NPCK and the first #.

For more details about membership, please follow the link: www.npck.org

NPCK Gold Members

National Potato Council of Kenya

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● Alliance for a Green Revolution in Africa (AGRA)
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● German Cooperation (GIZ)

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38 | National Potato Council of Kenya

39 | National Potato Council of Kenya
## Agrico East Africa

Agrico East Africa has 13 approved seed varieties in the Kenyan market, all high-quality high yielding seed potato varieties originating from The Netherlands. A selection of our top-performers in Kenya:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Maturing</th>
<th>Main Characteristics</th>
</tr>
</thead>
</table>
| Destiny | Early (±90 days) | * Early main or second season crop, suitable as a crisping / ware variety.  
* Good yield and good heat tolerance  
* High number of round tubers with yellow skin and shallow red eyes  
* High dry matter content (23.7%) – suitable for processing |
| Manitou | Medium (±100 days) | * A Maincrop ware variety with an attractive red skin  
* High-yield and very suitable for home fries or table  
* Large oval tuber with shallow eyes  
* Good heat tolerance |
| Markies | Late (±110 days) | * High-yielding all-round late maincrop variety  
* Good for fresh French fries (chips), crisping or fresh consumption  
* Large yellow uniform-sized oval tubers with shallow eyes  
* Good late blight and virus resistance |
| Rudolph | Medium (±95 days) | * A maincrop ware variety with attractive redskin and a very high yield  
* Good heat tolerance  
* Suitable for long-term storage  
* Nice table variety |

**Agrico East Africa**

Contact us on: [info@agrico.co.ke](mailto:info@agrico.co.ke), [www.agrico.nl](http://www.agrico.nl)

Tel: +254 741 788 380 / +254 722 206 179

Offices at Baba Dogo Road, Ruaraka, Nairobi & farm in Menengai, Nakuru