

Dear Reader,

The third wave of Covid-19 is unsettling as people try to find stability amid unstable circumstances. While the masses struggle to decide whether to rejoice that the vaccine is here, or approach it with caution, life goes on. For some, the change in patterns has created opportunities to try out new ventures. For example, farmers are breaking out of their ordinary poultry keeping and are now keeping ornamental birds, for their meat, eggs, or just as pets that they rear and sell at a profit, with some going for as high as Ksh10,000 per mature bird.

To help you ponder over the prevailing circumstances brought about by Covid-19, this edition of TOF Magazine, invites you to create opportunities in the ordinary things within your farm.

For example, are you a farmer, struggling with food insecurity, yet cassava is rotting away in the farm? Read the story of Tanga Kona Commercial Village, established by farmers from Busia and discover the potential of indigenous crops in breaking farmers out of poverty. Are you a tomato grower, investing in farm inputs, yet yielding poorly due to tomato pinworm (*Tuta absoluta*)? A scientist reveals the secret of smart agriculture in fighting these stubborn pests without relying on chemicals. Is your farm on slopy land, and rain is no longer a blessing as it brings along erosion and water runoff? There is so much you can do to turn the problem into an opportunity to collect water, while keeping your soil fertile through various soil-water management techniques. The answers are right there within your farm. Read on to discover them.



Sustainable, effective ways to manage *Tuta absoluta*

By Grace Kinyanjui

I recently talked to Mr Tokodi, a farmer, with a three-acre piece of land in Ngong, where he had recently invested Ksh500,000 on commercial tomato farming. Armed with enough resources for labour and farm inputs, including pesticides to spray on the tomatoes at intervals advised by the agrovet, Mr Tokodi, was sure he had made a worthwhile investment. Until his tomato plants had flowered and begun to fruit, only then did he realize that his yields were not market worthy. *Tuta absoluta* had infested his tomatoes and all the fruits were rotting. "I did not even harvest enough to take home let alone sell. I watched as my savings went down the drain, and all I had to show for it were crates of spoilt tomatoes," lamented Mr Tokodi.

While Mr Tokodi now knows that a soil test and an assessment of pest and disease incidence in the area could have saved him the loss, there is another fact he might not have known, the synthetic chemicals he sprayed on his tomato crops killed his friends, but his enemies survived. If the pest is resistant to these pesticides, as is *Tuta absoluta*, the farmer by spraying only kills all the natural enemies that could have reduced the pest population in the farm, leaving the pest to thrive and overwhelm the crops.

Managing *Tuta absoluta*

Tuta absoluta is a serious pest of tomato in Kenya. The larvae are the life stage that damages the crops. The pest is mainly controlled by applying synthetic pesticides. However, the persistence of *Tuta absoluta* problem has shown that chemical pesticides are not a sustainable strategy to control the pest. Pesticides also have undesired health and environmental effects. Farmers are therefore encouraged to embrace other pest control alternatives that are practical and sustainable. These include the combined use of biological control agents and adoption of good agricultural practices.

Biological control agents

Biological control agents are the naturally occurring natural enemies used to control pests. The most common natural enemies of *Tuta absoluta* are the predators and parasitoids. Recent studies in Kenya have shown that two predators, tomato bug (*Nesidiocoris tenuis*) and mirical predatory bug (*Macrolophus pygmaeus*) occur naturally on tomato crops. These are mirid bugs and are effective consumers of *Tuta absoluta* eggs. Both adults and nymphs feed on eggs, and adults can sometimes feed on the young larvae. An adult predator preys up to 85 eggs of *Tuta absoluta* per day. Other predators include lady bird beetles, predatory mites and



Continued from Page 1

ground beetles. Apart from *T. absoluta*, these predators also prey on other insects such as whiteflies, aphids, leaf miners and thrips, and can therefore provide effective biocontrol of many tomato pests.

Nine species of parasitoids of *Tuta absoluta* larvae have been identified in Kenya. These are small parasitic wasps that kill *Tuta absoluta* and many other tomato pests. All these natural enemies occur naturally and thus there are no additional costs for farmers to introduce them on tomato crops. The local biological control efforts have further been enhanced by the recent introduction of a South American parasitoid by the icipe scientists. This was recently released for the first time in Kenya in a tomato farm in Embu, Kirinyaga County. This foreign parasitoid also targets the larvae and provides effective control of the pest.

A good establishment of all these natural enemies on tomato crops can yield good results in the control of *Tuta absoluta*. This is because the predators prey mainly on eggs and prevent them from hatching, while the parasitoids kill the hatched larvae and reduce the levels of infestation. Above all, the success of biological control of *Tuta absoluta* depends strongly on the farmers.

What farmers need to do:

- Embrace agricultural practices that will conserve the natural enemies, such as minimizing the dependence on synthetic pesticides.
- Uphold good agricultural practices, which will discourage the growth of *Tuta absoluta* populations. These include early monitoring of the pest from the nursery stage, removal and destruction of infested leaves at the early stages on infestation, overall crop sanitation, removal and destruction of post-harvest crop residues and damaged fruits.

- Avoid crop rotation of tomato with closely related crops, which can also be attacked by the pest. Such crops include potatoes, black nightshade, french beans and eggplant.
- Practice mixed cropping so as to promote a rich diversity of natural enemies in the crop fields. Tomatoes can be intercropped with herbs, beans, amaranth, garlic, onions, asparagus, and other cover crops. Avoid intercropping tomatoes with spinach as they are heavy feeders and will compete for nutrients with tomatoes.
- Use biopesticides and traps to control high populations of *Tuta absoluta*. An example of a locally available biopesticide is Baciguard®16WDG from Greenlife Crop protection Africa, <https://www.greenlife.co.ke/baciguard-16wdg/>. This biopesticide contains bacteria called *Bacillus thuringiensis*, which is toxic to most insect pests found on tomato including *Tuta absoluta*. Farmers can also use Neemazal 1.2 EC from Twiga Chemicals, <https://www.twigachemicals.com/products/neemazal-1-2-ec/>. This biopesticide contains neem oil (*Azadirachtin indica*) that can control *T. absoluta* and other insect pests found on tomato. These can be obtained from Real IPM, Thika 0725 806086; Kipper Biological Systems, Mombasa Road 0731 202191; Dudutech and Navivasha, 0704 491120, among others. International Centre for Insect Physiology and Ecology (Icipe) has developed biopesticides to manage *Tuta absoluta*, which are undergoing the registration process, before release for use by farmers.

By using these approaches, tomato farmers will get good yields through pest-smart agriculture with little or no adverse effects on human health and the environment.

<https://infonet-biovision.org/PlantHealth/Crops/Tomato>

Techniques for soil water management in the farm to improve crop productivity

By Sharon Chebet

Soil water management is a critical aspect in land cultivation. Farmers practice various techniques in soil water management. Whether contour bunding/creating furrows, building terraces, molding ridges, or compartmental bunding, the most important guiding factor in choosing the right soil conservation measure, is your purpose. There are no practices of soil water management that would be suited for every location and therefore, it is important to choose structures that would give maximum results depending on the climatic conditions of your area, soil type and the cost of the technique you use. The ultimate goal of every soil water management technique is to slow down runoff, collect water that would have otherwise been lost, avoid soil erosion and consequently increase your crop yield as a result of improved soil moisture storage.

Managing water activity in the soil is done for various purposes including; to modify the soil slope, influence the run off or to grow crops in a steep slope.

The structures that will modify the slope are; *Fanya Juu*, level terraces and bench terraces. If the goal is to influence the surface runoff by either controlling or reducing loss of water then; contour bunds/furrows, compartmental bunds and ridges/tied ridges is the best option. Finally, the hill side ditches and intermittent terraces will enable you to grow crops in a steep slope.

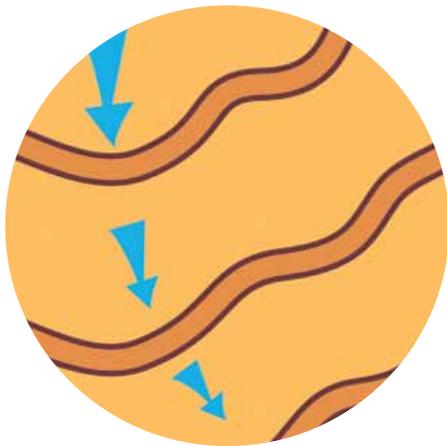
Contour bunds/ Contour furrows

This is also referred to as “strip farming”. This type of manipulation of land requires less soil movement compared to bench terracing and therefore, is suitable for areas that receive lower amounts of rainfall. The crops are grown along the strips while the catchment area is left to fallow. With this type of structure, you will collect the runoff water and improve the available water in your cropped area. The water movement into the soil



Tomatoes affected by *Tuta absoluta*

is slow and therefore, this is a limiting factor in areas that have “heavy” soils (a heavy soil is a fine-grained soil, made of clay or silt, excluding sand). For example, some parts of western Kenya have heavy soils and some Eastern side have sandy soils. With heavy soils, you risk waterlogging. It is important to lay your contour bunds accurately to avoid having uneven depths of ponding water behind the banks. This can be done by having smaller bunds at right angles and should be lower in height than the main ridges so that in case of overtopping, the water will move laterally and not over the bund. Contour bunds can be done by hand labour or ox drawn.



Terraces

Terracing is a common practice in slopy regions. Terraces are channels constructed across a field slope. They channel runoff water into a stable outlet, where it is carried safely away. The crops are grown along the slope and the channels are covered using grass or legumes. In the dryer regions, it is able to catch all the rain that falls but, in areas that experience heavy rainfall, there is need to create a way for the excess water to flow down the slope, in case of over saturation.

One of the common ways of building terraces that has been largely used in eastern Kenya is a technique locally referred to as ‘Fanya Juu’ Directly



translated in English ‘Throw upwards’. *Fanya-juu* terraces are constructed by throwing soil up slope from a ditch to form a bund along a contour. The trench is 60 cm wide by 60 cm deep, and the bund 50 cm high by 150 cm across at the base. Several of these terraces are made up the slope following the contour lines. The distance between bunds depends upon the slope and may be from 5 m apart on steeply sloping lands to 20 m apart on more gently sloping lands. In rocky areas, rocks can be used to enhance the terraces. *Fanya juu* requires less labour compared to other terracing techniques, and has been successfully used in Machakos and its environs to manage soil erosion and conserve water.

Ridges and tied Ridges

Ridges are furrows dug along contour lines to collect the rain that falls from unplanted sloping basins. This increases accumulation of water which consequently allows more water to be absorbed in the soil.

Planting is done on either side of the furrows, where the water is absorbed. The spacing between the ridges depends on the spacing between rows of the crop but the height of the ridges is 30cm high.



Basins are made by digging out shallow furrows along the contour lines of the slope and making ridges on the downside of the furrows. These are then “tied” together by slightly lower ridges which are made at regular intervals along the furrows. The ties should be spaced at 1 and 3 meter interval along the furrows and half to two thirds of height of the ridges. These ties can be done once a year or during the growing season. In addition, you can minimize the water loss by evaporation through mulching. The setting up can be done by hand or ox drawn.

Compartmental bunding

Compartmental bunding involves building earthen embankments across the slope of the land, following the contour as closely as possible. A series of such bunds divide the area into strips and act as barriers to the flow of water. The size of the bunds depends upon slope of the land. A height of 0.5 meters is recommended. This technique is suitable for areas with low rainfall, that is less 700mm of rainfall per year.

Compartmental bunding conserves the rainwater, recharges soil profile uniformly, reduces runoff, arrests soil and nutrient losses and increases crop yields on a sustainable basis. This is a technology that can easily be adopted by framers because the cost of construction is low and simple. In regard to the soil type, it is best suited for medium to deep black soils with high clay content.



Steps in forming compartmental bunds.

1. Till the land
2. Form the bunds along and across the slope at required intervals.
3. Using a spade, shaping the bunds at the corners of the compartments after field layout.



<https://infonet-biovision.org/EnvironmentalHealth/Introduction-soil-conservation-measures>

Tanga Kona Commercial Village; Bridging cassava producers to wealth

By Caroline Mwendwa

Located about 5 km from Busia town in a market called Alepo, Tanga Kona Commercial Village is the symbol of the future imagined and created by the cassava farmers residents of Busia, western Kenya.

It carries their story right from when all they knew were indigenous varieties of cassava that their great grandparents depended on for food, to date, when science and technology has transformed their lives through improved cassava varieties and economic empowerment through creation of markets for their farm produce.

The birth of Tanga Kona Village

In the year 1999, cassava farmers in Busia, and indeed all over Kenya bore the blunt of the deadly Cassava Mosaic Disease (CMD). This disease hit cassava farms leaving farmers impoverished and ravaging in hunger. There was nothing to harvest, and farmers had nothing to turn to in feeding their families. As they say, tough times call for tough solutions. A farmer group, by the name Agro-Farmers Self Help Group felt the need to look for solutions from scientists at KALRO. KALRO, through research brought to farmers improved varieties, among them; MH95/183; MM96/2840; MM96/2270; MM98/0293; Migyera; MM96/5280; MM4776, among others. Of these, MH95/183, was selected to be the most suitable for the region. Under proper agronomical practices, this variety can yield up to 20,000Kg of cassava per acre. These new varieties have the following advantages: they are high yielding, early maturing, have low cyanide levels and good underground storability, high dry matter content and are sweet to taste.

When the new varieties were introduced to farmers, they multiplied seeds and spread them widely to other farmers to plant. As a result of the high yielding nature of these varieties, there was so much to harvest, to a point that they had surplus. Farmers had nowhere to sell their farm produce, which had more than



doubled after the introduction of the improved varieties. Agro Farmers Self Help Group, a youth group then, had to go back to the drawing board, this time not pushed by hunger and poverty, but by bumper harvest. They had to create a market for cassava. That is how cassava processing cooperative came to be in 2010. They called it The Tanga Kona Commercial Village. To legalise it, it was first registered as a CBO, and in 2014, it was registered as a cooperative.

"We began with 56 registered members, and currently the cooperative has grown to 406 registered members," says Mr Maurice Olaba, the secretary at the cooperative. The cooperative does not only buy cassava from its members, but non members as well. It is currently working with 3,000 farmers, but members enjoy benefits that non-members do not. For instance, markets for seeds are availed to members as priority.

Activities of the cooperative

The cooperative buys fresh tubers from farmers at Ksh5 per kg, to process it into various products including flour and crisps. "We are trained by KALRO on these processes and all our products are certified by the Kenya Bureau of Standards (KEBS)," says Mr Olaba. The cooperative has 15 employees but increases the number of casual staff depending on need.

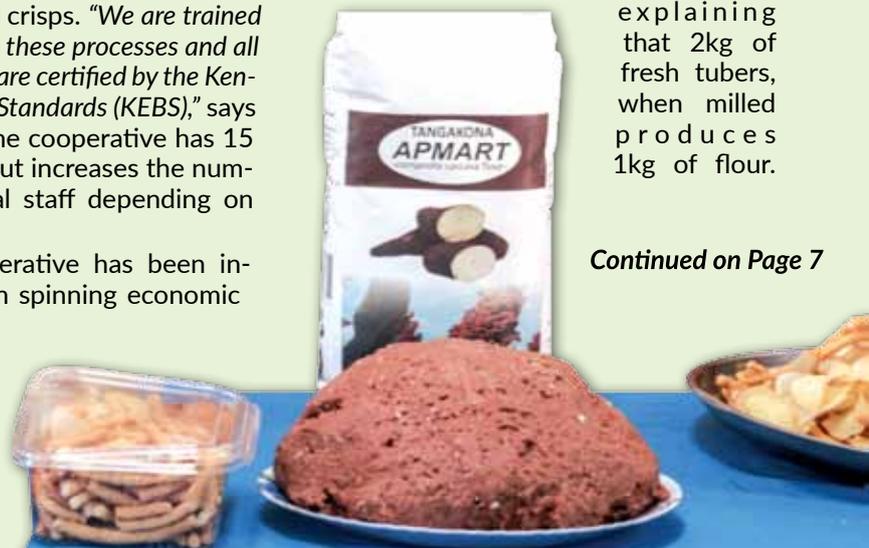
The cooperative has been instrumental in spinning economic development of residents in the area as

farmers are now confident to produce cassava in large scale. "Our farmers are now thinking commercially, and we have farmers growing even up to ten acres of cassava," says Mr Olaba. Through the cooperative, farmers have learnt that there are many ways of preparing cassava, not just by boiling. Families are now using the flour to make ugali and chapati. Chopped cassava is also used to make crisps, when deep fried and a nutritious meal for breakfast when boiled.

Markets for cassava products

Cassava being an indigenous food crop, which does not require synthetic fertilizers in planting and has low gluten levels with a myriad nutritional benefits, has become the preferred substitute for people with conditions such as gluten intolerance. "We are always getting orders for cassava flour from various organizations, for example, we are currently preparing flour, to supply to two clients who have placed monthly orders. One requires 10,000kg every month, and another 2,000kg to 6,000kg every month,"

says Mr Olaba explaining that 2kg of fresh tubers, when milled produces 1kg of flour.



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All you need to know about organic certification

By Njeri Kinuthia

Small scale farmers in Kenya have for a long time concentrated in the production of food crops targeting the local markets. This has denied them reach to international markets which would offer premium returns on their products. Most export markets have set standards such as the need for producers to be organic certified. As the world becomes more like a global village, international markets are opening to local producers, and farmers must step up to these opportunities by ensuring that their produce meet the required standards. One example is the cassava market. Countries beyond the African continent are in dire need of cassava flour, for various reasons, majorly health. Kenya, especially, western Kenya, is a major producer of cassava, and if well organised, cassava producers in this region could tap on these emerging international markets to improve their livelihoods. One way to achieve this, is through working with cooperative societies to ensure that farmer groups supplying cassava for processing into flour have organic certification, for their produce to be acceptable in these markets.

A cassava cooperative society in Busia Kenya, Tanga Kona CBO is currently faced with this need after an American based customer, requested to be receiving 25,000Kg of organic cassava flour per week. The group has been selling their products to the local markets and their farmer suppliers are not organic certified, even though cassava does not require substantial chemical inputs to grow, since it is an indigenous crop.

Just like many other groups wishing they could have the organic certificate for their produce to be acceptable in export markets, knowing the various kinds of certification and what they entail is the first step for this society, to have its suppliers certified.

What is organic certification and why it is important?

Any business directly involved in food production or processing can be certified, including seed suppliers, farmers, food processors, retailers and restaurants.

Organic certification is a process by which an independent party gives a written assurance that the production/processing systems are in conformity with organic standards. This allows access to better markets. Organic farming also has other benefits such as in-

creased resilience to climate change, environmental sustainability and access to healthy foods. This is because organic agriculture is a holistic production based on sustainable ecosystems, safe food, good nutrition, animal welfare and social justice.

During the production of organic produce there is avoidance of synthetic chemical inputs as fertilizers, pesticides antibiotics, food additives, sewage sludge and genetically modified seeds. The farmland should be free from prohibited chemical inputs for a number of years which usually range from two or more years. Maintaining physical separation of organic and non-organic products is strictly followed.

There are various organic standards at the private, national, regional, and international level. The International Federation of Organic Agriculture Movement (IFOAM) Basic Standards and Codex standards provide a framework for certification bodies and standard setting organizations worldwide to develop their own certification standards and cannot be used for certification on their own.

The aims of organic standards are:

- To protect consumers of organic products against fraud in the markets.
- To protect producers against fake input suppliers.
- Give assurance that all processes in organic production, handling, up to marketing are screened and inspected to comply with set standards.
- Provide harmony for production, certification, identification and labeling of organically grown produce.
- To provide international guidelines for organic food control systems and facilitate recognition of national systems as equivalent for the purposes of imports and exports.

Types of organic certification

Third-party certification

Third-party certification is whereby the farm, or the business is certified by an accredited organic certification agency guided by national or international standards. To acquire this certification, the farmer, or the processor is required to undertake the following:

- Ensure that he/she has adequate knowledge on the organic practices/standards, on what is allowed or not allowed in the practice of organic farming by studying the available resources on organic farming.
- Work to ensure that the production methods including all farm inputs, sources and suppliers follow the organic standards.
- Keeping records of the history of the farm and current farm activities espe-

cially results of tests done on soil and water.

- Production/processing plans in case of a farmer, there should be clear records of how the production process is intended to be done. That is, in seeds sourcing, soil fertility management, pest control, harvesting and post harvest management.
- Random and planned inspections and tests on soil and water are to be done to ensure that the recommended approaches are being followed, and that the records are kept consistently.

If the farmer is transitioning from conventional to organic farming, the farm must have been free of prohibited substances for 2-3 years. During this period of transition, the produce is not considered fully organic.

For other operations other than farming, the main areas of focus will be on the quality of ingredients, if in processing, and the conditions of processing, packaging, and transport.

Participatory Guarantee Systems (PGS)

Nowadays smallholder farmers can be certified under PGS (participatory guarantee system) which is an alternative for the third-party certification.

In PGS, farmers, consumers and stakeholders of the groups undergoing the process participate directly in choosing the standards of the processes, developing, and implementing the certification procedures and decisions.

PGS certify group producers based on their active participation and it is built on trust social networks and exchange of knowledge. It is done in groups and all participants must come from the same locality. If one member falls short of the set standards, in the process, the whole group loses credibility and cannot be certified. It is important to note that the certificate is renewed annually.

Certification bodies in Kenya

Kenya, Uganda, and Tanzania joined together to harmonize the existing organic standards into one as East Africa Organic Products Standard which was launched in 2005 and 2006. Under this umbrella, there are existing bodies that provide certification services in Kenya and other East African countries. These include: The Kenya Certifiers -0727 977 009; Encert.net- 0724 910 210; Ecocert- 0725 527 521 and Control Union- 0702 618 885. All these are renowned certifiers in Kenya.

<https://infonet-biovision.org/Publications/IFOAM-Norms-Organic-Production-and-Processing-2014>

Ornamental chicken farming, a new venture in Kenya

By Charei Munene

Introduction

Ornamental chicken farming is a new promising venture for the poultry farmer in Kenya. Ornamental chicken are breeds of chicken reared for their special physical attributes. These attributes include size, colour and type of plumage. Due to their rare occurrence, they are high value birds. Kenyan farmers are taking advantage of the new market and making good profit. Ornamental chicken farming is steadily creating a reliable market niche away from the traditional layers and broilers. In this edition, we sample a few ornamental chickens you can rear in diversifying your source of income.



1. Brahma

Famed for its size and known as King of 'Chickens', it's a docile, calm breed that is kept for its meat, and eggs. Brahmas are large chickens with feathers on the shanks, toes and pea comb. They come in three color varieties - the Light, the Dark, and the Buff. Despite their size and intimidating appearance they are gentle giants. They have feathered feet which give them an adorably cuddly appearance. They have a very beautiful plumage which only adds to this special breeds appeal.

One-week chick costs between Ksh1,500 - Ksh2,000, one month old, Ksh3,000 - Ksh4,000 and a full-grown Brahma of about 2 years fetches between Ksh20,000 - Ksh40,000. To buy call 0712 250 007.

2. Silkie Bantam

Silkie are gentle, kind birds who love company and adore being held and fussed over. They have downy feathers which come in a multitude of colours including white, black, blue, grey, gold and porcelain. Silkies come in standard or 'Bearded' - the Bearded Silkie has a beard and muffs. All Silkies have a black face, bones and skin. Their flesh is dark grey blue.

Once they are familiar with their keeper, they form an attachment and develop a habit of following him/her around while chattering. Silkies lay about 100 to 120 eggs in a year. A one-month-old chick costs between Ksh1000 - Ksh2000. A mature Silkie of 8-10 months costs between Ksh5000 - Ksh6000. To buy call 0710 166 177/0712 250 007.



3. Kuchi

Kuchi is a super-sized bird that weighs twice as much as conventional breeds. It is an indigenous bird originating from Mwanza Tanzania. It is resistant to most chicken diseases; this explains why it is gaining popularity among Kenyan farmers at high rate. It is recommendable to rear Kuchi males and females separately from week 12 since females mature faster. Kuchi birds take longer to mature and are therefore not ideal for quick production of meat. However, they attain larger sizes than common breeds in the long run.

A one-month-old chick costs between Ksh1000 - Ksh2000. A mature Kuchi bird of 6-12 months costs around Ksh8,000. To buy call 0782 223 000.



4. Yokohama Long tail

The Yokohama chicken is an ornamental long-tailed European breed. It originated from Japan. It has a short beak, small head, and pea or walnut comb. Yokohama has a streamlined, horizontal stature; inclining slightly, but steadily, from its head through its long feathery tail. Yokohama chickens have tails of three to four feet in length. In Japan, these birds have a history of growing tails up to 27 feet in length. It lays between 12-14 eggs before brooding. The chicks are hardy, but require extra protein when their tails are growing. The breed is well-suited to estates where it can roam at large, without confinement.

This breed has only recently been introduced in Kenya. A mature Yokohama chicken of between 7-10 months is currently retailing at Ksh10,000. To buy call 0714 731 426.

5. Frizzle chicken

Frizzle chickens are a fabulous breed of backyard chickens renowned for their lively plumage, quality eggs and calm, docile, peace-loving temperament. Frizzling is where the feather starts to curl upward and outward from the body instead of lying flat against the body as in a 'normal' hen. Known in many countries as a show bird, the Frizzle is not well known for its' egg laying ability but makes excellent mothers.

A one month chick costs about Ksh300 while an adult of about 6 months costs between Ksh1500 - Ksh2000. To buy call 0763 098 799.





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He goes on to talk about the expanding markets saying that the cooperative recently received an order from an American based organization, to supply 25,000kg of cassava flour weekly, and the cassava used to make this flour must be obtained from organically certified farmers. This reveals the need for farmers to learn skills in organic farming, and the cooperative management has taken this up, in conjunction with Biovision Africa Trust.

With growing markets, the cooperative is optimistic that farmers will keep growing cassava at large scale, for the cooperative to meet the demand.

Challenges

The enterprise is however not without its challenges. A major challenge as Mr Olaba points out, is that due to the bulky nature of cassava, transport from homes to the cooperative poses a huge challenge, for farmers. *“Most farmers are grappling with poverty, and transport for cassava can be costly. To provide a solution, we have established six collection centers near our farmers where they take the fresh cassava for processing into flour. The flour is then brought to the cooperative,”* elaborates Mr Olaba.

Another challenge is that farmers are afraid of joining the cooperative, for the fear that it might fail, and this limits its capital base. To encourage non members to register as members, the society offers incentives to members such as giving them seeds.

Aspirations

Already, Tanga Kona is set for growth and as Mr Olaba avers, plans are underway to build it into a company that has branches in various locations, each branch concerned with processing a specific product.

To conclude in Mr Olaba's words, *“cassava is the way to go, it's a driver of change, it fights poverty and creates wealth.”*



TOF Radio answers farmers' questions

How to improve your production of beans and earn more this season

Musdalafa Lyaga

“How can I make more money from growing common beans this season,” – Lilian Mwendu, Masinga.

Common beans (*Phaseolus vulgaris* L.) are one of the most important food legumes in Kenya grown mainly for food and income.

With a high demand in urban and rural areas, beans provide farmers high returns on investments, require less labor and external inputs than do many other crops.

Experienced farmers over time have also learned that they can benefit more from common beans by integrating growing beans with keeping livestock for good soil fertility management and easy access to manure to reduce dependence on external inputs.

Agronomic conditions for common beans

Common beans grow well on both productive and low yielding soil types with median soil pH between 5.0 and 6.0. They thrive in areas with annual rainfall

between 400 mm and 1,200 mm with maturing periods of around 70 days for short duration varieties, and 110 days for long duration varieties.

In many regions in Kenya, there are two distinct production periods. The main period is from March to May, where the common beans are most often intercropped with maize. In the second production period from late October to December, many farmers opt to plant beans as single crops.

Land preparation

Soil preparation starts before the onset of rains, to provide appropriate conditions for seed germination and plant development, including air circulation, improved infiltration, soil temperatures as well as for weed control.

The first ploughing is usually carried out 30-45 days before sowing, to break possible hard pans. The first harrowing is done 10 to 15 days after ploughing. The second harrowing is done right before sowing.

Farmers choose bean varieties with a high demand in the market.

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<https://infonet-biovision.org/PlantHealth/Crops/Cassava>



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| Nairobi | 102.7 |
| Kakamega | 91.5 |
| Bungoma | |
| Busia | |
| Malindi | 106.3 |
| Location | Frequency |
| Webuye | 95.9 |
| Garissa | 88.7 |

| Location | Frequency |
|----------|-----------|
| Taita | 107.4 |
| Narok | 102.3 |
| Nyeri | 105.7 |
| Machakos | 93.8 |
| Makueni | |
| Kitui | |
| Meru | 105.1 |
| Marsabit | 88.3 |

| Location | Frequency |
|----------|-----------|
| Nakuru | 104.5 |
| Gilgil | |
| Kisii | 91.3 |
| Kisumu | 105.3 |
| Mombasa | 105.1 |
| Kericho | 90.5 |
| Eldoret | 91.1 |

Tuko Mbele Pamoja!

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During sowing, seed rates vary from 45 to 65 kg/ha.

Soil fertility management

Common beans need soil fertility management to ensure that the right quantities of essential macro and micro-nutrients are available at the right time, for plant establishment, growth and reproductive processes. To ensure your beans have the right nutritional requirements apply organic manure at a rate of 5,000 kg/ha.

Intercropping

Common beans can be intercropped with cereals such as maize, sorghum or pearl millet. Farmers intercrop beans with cereals mainly for better soil fertility management, crop diversification as part of risk management and enhanced productivity at reduced production costs. The spacing depends on the varieties of both the cereal crop and beans.

It is important that the spacing allows the right plant populations for both crops and reduces plant competition for resources such as light, nutrients and water.

During the growing period, the field is maintained free of weeds.

Harvesting

Common beans can be harvested 70 to 110 days after planting, depending on the variety and growth type. Early maturity varieties can be harvested earlier. They mature faster but bring lower yields. They are more appropriate where rain is uncertain in the arid and semi-arid

regions. The late maturing allows for accumulation of more biomass that is then translated to pod formation and pod filling.

After harvesting, the plants are left to dry for a couple of days before separating the pods from the plants. When picking the pods, make sure to discard diseased, sprouted, or insect damaged pods. Once the grains have been separated from the pods, they are dried in sunlight to 13-14% humidity, a process that takes 2-4 days depending on the intensity of the sunlight and temperature.

What markets work for small-holder farmers?

To move from subsistence to market-oriented production, farmers are now following improved marketing practices.

Instead of selling common beans immediately after harvest, farmers conserve and store the beans. Selling at least four months after harvest means the farmer gets 50% higher prices, which translates into higher revenues. However, this requires farmers to have adequate and safe storage facilities. In addition, foregoing selling their produce now means farmers cannot obtain cash immediately, which they might be needing at that moment. This means solutions need to

be found for farmers to overcome cash constraints during the period that they are storing their produce.

By forming better organized communities such as cooperatives, farmers can assemble larger volumes of beans for sale thereby attracting traders. Furthermore, they will have stronger negotiation power to determine prices. They can refuse to sell below a certain price. If farmers are organized, they can also negotiate with supermarket chains and distribution outlets, which can offer to buy in bulk, and at the same time offer them a higher and attractive price for their produce. Collective selling also saves the farmers on some transaction costs such as transport.

Consumers are prepared to pay higher if they are assured of a high quality and safe produce. If the produce has organic certification, farmers will attract high-end traders, retailers and consumers who require high quality and are willing to pay premium prices for it.

<https://infonet-biovision.org/PlantHealth/Crops/Beans>

FARMERS FORUM

Maina Munoru from Thigio, Nyahururu is looking for macadamia seedlings. To reach him call **0726 700 106**.

Peter Mutungi from Makueni is selling kienyeji chicken. To reach him call **0719 827 367**.

Looking for tomato seedlings? Call **Regina Musembi** at **0702 983 051**.

5,000 kg

amount of organic manure required per hectare



Partner organizations



To contact us on the "tusemezane" platform or ask a question, kindly call or sms +254 715422460. Mail to: feedback@biovisionafrica.org

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