

How to select a good cow

TOF - Dairy farmers willing to increase their milking herd have to be careful. It is important to choose healthy, strong cows which can produce more milk over a longer period of time. When doing this, concentrate on observable features that will allow you to judge it. For instance: Look for cows with deep, long body with wide, well-sprung ribs and with angular body shape. Such large body capacity has ample space for the rumen and digestive system. In this issue, we educate you about conformation traits that enable you to choose a good cow. *Page 3.*



More farmers want Fleckvieh semen

TOF - Farmers seem eager to improve their cattle with Fleckvieh semen. At least four farmers per week ask where they can get the semen. Fleckvieh are strong and high yielding animals with nutritious milk. The breeds are hardy animals which do not fall sick easily. The cows are popular for regular fertility, excellent adaptability and docile character. The dual-purpose breed not only provides milk but also beef. Farmers interested in acquiring the semen, can obtain appropriate information on addresses or artificial insemination providers from our website - www.organicfarmermagazine.org, just click on Artificial Insemination providers.

All about carrot growing

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Demand for Naivasha chicken breed exceeds supply

KARI Naivasha offers farmers' groups training in chicken management.

TOF | In *The Organic Farmer*, issue No. 85 of June 2013, we wrote about the improved indigenous chickens breed from KARI, Naivasha. Since the publication of this article, we have been swamped with calls from farmers across the country who want to rear this breed. Unfortunately, its demand has outstripped the supply as the research centre does not have the capacity to supply all the farmers with day old chicks or even fertile eggs for incubation. The station has only one incubator with a capacity of 20,000 eggs.

Farmers interested in this breed of chickens have to place an order and wait for 4 to 6 weeks to get their supply of day old chicks. To alleviate the shortage of this popular breed, the scientist in charge of the project Dr. Ann Wachira says that if farmers in various parts of the country can come together and form breeding groups, the centre would sell them day-old

chicks. The farmers can then rear the chicks for one month and later sell the month-old chicks to other interested farmers.

Dr. Wachira says the centre is ready to provide a three day intensive training at the centre to such groups in areas such as brooder management, vaccine handling, feeding and chickens housing before they can start the business. Farmers groups or individual farmers interested in these chickens or training are advised to get in touch with the centre: KARI Naivasha, P.O Box 20117, Tel. 0708 620 095/7, or send an email to karipoultry@gmail.com



TOF moved office

The offices of The Organic Farmer and *TOF Radio* have moved from Nairobi/Westlands to *icipe*, Duduville campus, situated along Thika road in Kasarani.

Our new address:

The Organic Farmer, P.O.Box, 30772-00100, Nairobi

Dear farmers

Farmers are often at a loss when it comes to making decisions on the appropriate crops they need to grow for the market, the reason why most of them stick to the same type of crops every season. In the process, they end up flooding the market with similar farm produce forcing the prices to go down - and their income as well.

East Africa's urban population is growing quickly. This means that the number of consumers is also growing. The demand for fresh vegetables and fruits is therefore very high. With good planning and a proper sense of timing, any farmer can take advantage of the market opportunities to grow selected fresh vegetables and fruits.

In this issue, we highlight stingless bee keeping, selection of good dairy cows and use of cassava for making poultry feeds. We also feature carrot farming to be followed by onion farming in September. These are important crops that can generate good income for farmers if grown at the right time for the market. Most of the carrots consumed in major towns in Uganda come from Kenya. Tanzania is a major source of bulb onions and even tomatoes in Kenya's urban areas. A wise farmer can take advantage of the local and expanded East African market opportunities to grow and sell these crops when the demand is high. This of course requires good planning and a careful assessment of market trends.

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KBC Thursday 8.15 pm

Stingless bee project protects rain forest



Meliponula ferruginea (Black)



Hypotrigona gribodoi



Meliponula ferruginea (Reddish Brown)



Meliponula bocandei

Photos: Kiatoko-icipe

Encouraging farmers to domesticate stingless bees will reduce pressure on the forests.

Peter Kamau | Kakamega forest is one of the last remaining tropical rain forests in Kenya. However, like all the other forests in the country, it is fast disappearing due to increased human activity, which has diminished its ability to recover through natural regeneration. Destructive exploitation of the forest's resources through charcoal burning, forest fires, grazing, cutting poles for house construction and for sale as well as wild honey harvesting is rampant.

Of the many species of beneficial insects that are found in Kakamega forest, stingless bees occupy a special place. "According to studies conducted earlier, the diversity of stingless bee species is directly related to the conservation of the forest," says Dr. Kiatoko Nkoba, an *icipe* scientist undertaking research

in the forest. "The more their habitats are destroyed, the less the species you get. The stingless bees are threatened if the destruction of the rain forest is not stopped," he adds. Using indigenous knowledge, *icipe* scientists have identified six species of stingless bees and their preferred habitats.

The Commercial Insects Project (CIP) of *icipe* is one of the initiatives that have been started in Kakamega forest to support forest conservation using stingless bees as an entry point. The project realized that stingless bees are important pollination agents and thus play an essential role in the maintenance of the forest's biodiversity. However, communities living around the forest have concentrated on wild honey prospecting while paying little attention to conservation of the forest that supports stingless bees.

Important pollinators

The CIP project's main aim is to integrate stingless bees into forest conservation and diversify the

income for communities living around the forest. It encourages them to keep the bees around their homesteads, both for pollination purposes and honey production. The project has introduced modern stingless bee management practices that include special hives, clean honey harvesting, packaging and storage methods. Stingless beekeepers now have a steady income from selling honey while at the same time conserving the forest.

The beekeepers have been trained on stingless bee handling, management, colony multiplication, honey harvesting, transport and storage. So far 35 honey hunters have been converted into stingless beekeepers. Transforming the honey hunters into professional beekeepers might have an immense benefit to the rain forest ecosystem as they are now expected to contribute more to its conservation.



The *icipe* project has provided Kakamega bee-keepers with modern stingless bee hives to enable them domesticate stingless bees.

How to domesticate stingless bees

Stingless bees have disappeared in many parts of Kenya due to the destruction of forests, which were their main habitats. Many farmers have expressed interest in keeping stingless bees whose honey is also highly valued because it is believed to have medicinal properties. One way is for farmers to rear the bees within their homesteads.

Farmers should know that stingless bees cannot survive in cold areas especially in areas with temperatures below 20°C.

Farmers are advised to do a survey in their areas to determine if there are any stingless bee species that are common in their locality. If a stingless bee nest is located, beekeepers can take the following steps to transfer the bees into a beehive:

- Dig the entrance tunnel until you reach the nest.
- Remove the soil around the cavity. Do not pull the nest as this may crash the brood.
- Free the nest by gently removing the soil around it.

- Do not scrap the honey pot because the honey will pour out into the brood and attract pests such as the hive beetles, ants and phorid flies whose larvae feed on the brood.

- Separate pollen pot from the brood.
- Place the brood in the hive to lie in the vertical position, place top cover and seal the gaps with a masking tape. Take the substance from entrance tunnel and smear it on the entrance to the hive to attract the bees.

- If you are transporting the brood for long distances, seal gaps and nest entrance and open it the following day when you have arrived at nest site where you intend to place the hive.

NOTE: Other methods of domesticating stingless bees will be given in the coming issues of the magazine. The stingless bee project is led by Prof. Suresh Raina and Dr Didi Kiatoko Nkoba and funded by IFAD and the European Union.

The Organic Farmer is an independent magazine for the East African farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. It is published monthly by *icipe*. The reports in the *The Organic Farmer* do not necessarily reflect the views of *icipe*.



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Carrots can earn good money in the market

Farmers can take advantage of the growing market for carrots in East Africa to diversify their income. They are also nutritious for the family.

Caroline Nyakundi | Carrots are a popular vegetable in Kenya and can be eaten raw or cooked in soups, sauces and salads. They are a good source of vitamin A, whose deficiency causes blindness.

Carrots have a good market especially in major towns such as Nairobi, Nakuru, Eldoret, Kisumu and Mombasa, which have large urban populations. All other major urban centres in the country also offer a good market for carrots throughout the year.

The crop grows well in cool to warm climates. To get carrots with the best colour and flavour, it is important to grow them between temperatures of 15°C to 20°C. Very high temperatures result in pale carrots with shorter roots and poor flavour. Carrots become brittle and crack in very cool temperatures. For the farmer to get the best yields, it is advisable to plant carrots in deep, well-drained, well prepared loam soils, which allow the roots to penetrate and swell.

Land preparation

The field should be prepared well to ensure better quality carrots. Remove all weeds, grind the soil and mix with well-composted manure at a rate of 3-5 tons/ha at least one week before planting carrots; be careful with manure application because rich soil can lead to excessive leaf growth and carrots with forked hairy rough roots. Rake the soil to a fine tilth before preparing raised beds about 20 cm high for good drainage, 1m wide and 0.3 m apart, the planting beds should be separated by paths 40 cm by 50 cm wide.

Weeds are a big problem in carrots, because they are a slow-growing crop and their foliage does not shade out competing plant pests. Careful weeding is important.



Farmers pack carrots in readiness for the market at Likia, Njoro. Most of the carrots from this area are exported to Uganda.

It is best to talk to the local suppliers about carrot seeds that are best suited to your area. Soils with a PH of 6.5 – 7.5 are perfect for growing carrots, although many farmers do not know that carrots are sensitive to acidic soils. If the PH is lower than 5.5 (acidic soil) apply moderate amounts of rock phosphate fertilizers to reduce acidity. Always remember to take a soil sample for pH and nutrient analysis and apply fertilizer and/or lime or rock phosphate appropriately.

Sowing

Carrot seeds are planted directly into raised seedbeds. Well-prepared soils 1/2 - 1 cm deep in drills or furrows about 20 cm – 30 cm apart (use your fingernail to make the furrows). It is a mistake to sow the seeds too closely as this causes overcrowding and leads to poor yield. Apply about 6-7 kg of carrot seeds per hectare.

This method also allows the carrot roots to penetrate the soil better and hold more water. Once the seeds have germinated, at about 2 weeks, do the first weeding. At this time, thin-

ning of the carrots should also be done to provide the plants with enough space to grow well. Four weeks after sowing carrot seeds the second weeding should be done while hilling (earthing) is done 45 days after the first weeding. Ensure they get adequate water throughout the growing season.

Since carrots do not need a lot of space to grow, they are the best when it comes to intercropping with other crops like tomatoes, lettuce or capsicums, whose scent can help reduce carrot pests. Carrots can also be planted together with garlic, dwarf bean, onion, parsnip, leek, small peas and radish. The most profitable example of a symbiotic association is that of carrots and leeks. When carrots and leeks are intercropped, carrots can drive away worms from leeks, while leeks help repel flies from the carrots.

Carrots need a lot of water during the first 4 weeks after sowing. Ideally in loam soils, watering should be done every 5-7 days. However, in sandy soils more frequent watering is needed. When carrots are not watered regularly, they tend to crack and fork (growth offshoots) at the roots.

Pests and diseases

Carrots are susceptible to pests like aphids, root-knot nematodes, cutworms, African armyworm and fungal diseases such as powdery mildew, cottony soft rot, leaf blight and damping-off diseases. Rotating carrots in different beds around the garden and planting cereals and forage grasses at alternate times is rec-

ommended to avoid build up of diseases. It is also important for it enables the farmer to practice good field hygiene, use resistant hybrid seeds and ensure carrot seeds are certified disease-free.

Harvesting and storage

Carrots are usually harvested after 2-3 months, when the roots are soft and juicy. "Baby carrots" may be harvested when they are still very slender while in some cases farmers prefer to wait until the roots are about 20mm or more. One should not take too long to harvest because once the carrots ripen, they start cracking and this reduces their quality. When harvesting remove the entire plant from the field by manually pulling up the roots if the soil is moist and soft.

You may also use a spade if the soil is too hard or dry. To ensure the carrots are ready for the market, trim the tops completely to avoid storage rots. Mature carrots that are free of damage, pests and diseases can be stored for 100-150 days when the leaves are removed. They should be kept at 1-4°C with 95-100% relative humidity. The most common are Chantenay, Nantes and Oxheart. Other carrot varieties are Amsterdam forcing, Little Finger, Nebula F1 and Touchon.

facts & figures

- Retail prices of carrots in Nairobi currently range from Ksh 50 to 80/kg in local retail markets like Kangemi and Muthurwa/Wakulima. The lower quality costs Ksh 30/kg or less.
- Average retail price in Uchumi Supermarkets is Ksh 98.50 while Naivas is Ksh 75/kg.
- Current average wholesale prices are Ksh. 31/kg in Nairobi, Ksh 40/kg in Mombasa, Ksh 28/kg in Kisumu and Ksh 22/kg in Eldoret.
- On average, farmers in carrot growing areas like Kinangop fetch Ksh 19 to Ksh 21 per kg of carrots. Most sell their produce to middlemen from Nairobi.
- The most common carrot variety in Kenya is Nantes, which is preferred because of its deep orange colour and sweet taste. It keeps fresh longer and can be grown in all seasons.
- More information about carrot production, can be found in the Infonet Biovision website under crops, fruits and vegetables section.

Conformation traits farmers should go for when

A good understanding of the traits of a cow ensures herd improvement from generation to generation.

Job Kiprotich | It is the aim of every dairy farmer to breed healthy and productive cows. Animals that produce high yields over many lactations (milking period) easily are the most sought after. While bull selection for dairy breeding remains a challenge to dairy farmers in Kenya, bull selection is only part of the equation. Cows features also determine what kind of bull is the right one to serve your cow.

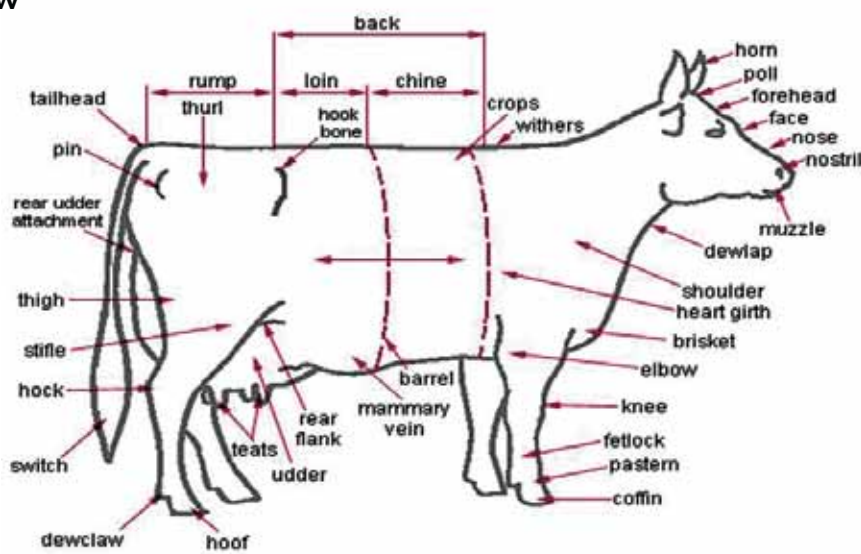
As mentioned in TOF June 2013 edition, many farmers choose the semen for their cows based primarily on the price of the semen. As such, they end up choosing the wrong bull for their cows and also their farming system. This article is a continuation of the terms and features contained in the Bull Catalogues and sire summaries.

Road map for breeders

Linear Type Scoring is a classification that describes the conformation of an animal biologically on a scale of 1-9. It is the road map for the breeder and dairy farmer in deciding on his sire selection as to the type of animal that suits his farming system.

The ideal cow

A strong dairy cow with a wedge-shaped rump (back side of a cow), in top as well as in side view, and with a slightly sloped rump angle; stature depends on breed; a square, high-quality and well-attached udder with close front teat placement and strong suspensory ligament; excellent use of legs and feet.



Standard traits have been identified that directly influence milk production ability and longevity, the two factors that determine the eventual profitability of a dairy cow. These linear traits are: stature, chest width, body depth, angularity, pelvic angle, rump width, rear legs rear view, rear legs set and foot angle. Farmers who use local semen from Kenya Animal Generic Resources Centre – formerly CAIS, and also those using imported semen are familiar with these animal breeding terms.

What traits to look for

The assessment parameters should be based on the expected biological extremes of a cow at first lactation. Here are the descriptions of each of the traits.

Stature: measured in inches from the top of the spine in between hips to the ground. A score of 9 is considered tall, 5 is an average and 1 is short.

Chest width
Measured from the inside surface between the top of the front legs. Wide – 9, Average – 5, Narrow – 1.

Body depth
Distance between top of spine and bottom of barrel at last rib. Deep – 9, Average, Shallow – 1.

Rump width
The distance between the most posterior point of pin bones. 1 - narrow; 5 - average, 9 - wide.

Rear legs side view
Angle measured at the front of the hock. Straight or sickled legs are not appreciated. 1 - extremely straight; 5 - slightly set to hock; 9 - too sickled.

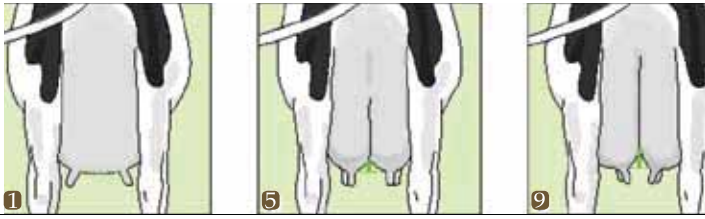
Foot angle
Angle at the front of the rear hoof measured from the floor to the hairline of the right foot. 1 - very low angle; 5 - intermediate angle; 9 - very steep angle.

Rear legs rear view
Direction of the rear feet when viewed from the rear. 1 - extremely toe out that lacks mobility; 5 - slightly toe out; 9 - parallel feet.

le selecting their dairy cows

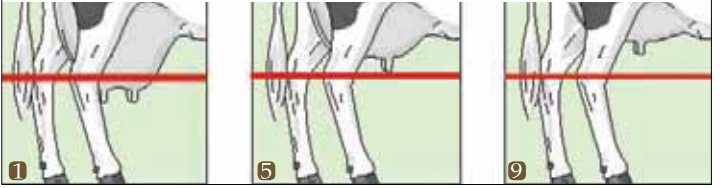
Central ligament

The depth of cleft at the base of the rear udder. Ligaments should be clearly visible and continue high upwards. 1 – convex to flat floor with broken ligament; 5 - intermediate; 9 – deep cleft/strong ligament.



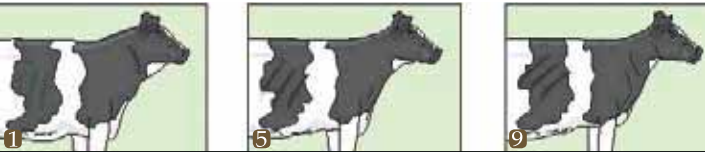
Udder depth

The distance from the lowest part of the udder flock to the hock. 1 – deep; 5 – intermediate; 9 – shallow.



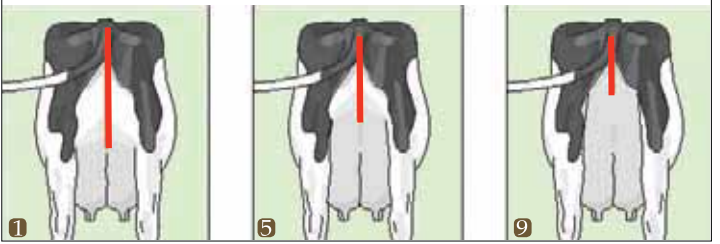
Angularity

This is also called dairy form. It refers to the angle and spring of the ribs, though it is not a true linear trait. A scale of 9 – is very angular with open ribbed flat bone; 5 – average; 1- lacks angularity, with close ribs and course bone.



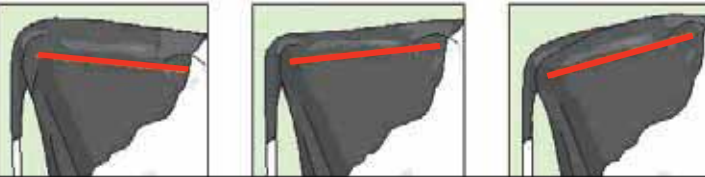
Rear udder height

The distance between the bottom of the vulva and the milk secreting tissue, in relation to the height of the animal. 1 – low; intermediate; 9 – high.



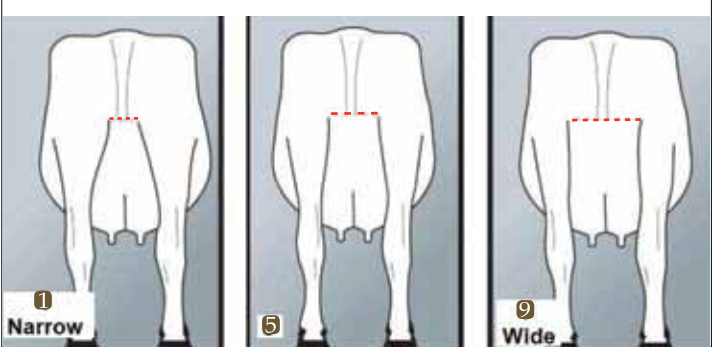
Pelvic angle

Is the slope from hip to pin bones. It is measured as the angle of the rump structure from hips to pins. Generally, the pins should be slightly lower than the hips. 1- high pins; 5 – average; 9 - extreme slope.



Rear udder width

Width of the udder at the point where the milk secretion tissue is attached. 1 – narrow; 5 – intermediate; 9 – wide.



Fore udder attachment

The strength of the attachment of fore udder to the abdominal wall. The udder should continue well forwards. 1 – weak and loose; 5 – intermediate strength; 9 – very strong and tight.



Teat length

The length of the front teat. 1 – short; 5 – intermediate; 9 – long.



Front teat placement

The position of the front teat from the center of the quarter as viewed from the rear. 1 – outside of quarter; 5 – centrally placed; 9 – extremely close towards the inside of the quarter.

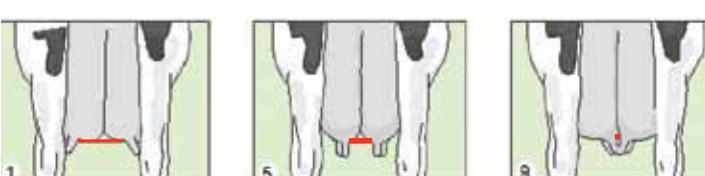


Movement

The use of legs and feet, length and the direction of the step. 1 – severe abduction/short strides; 5 – slight abduction/medium stride; 9 – no abduction/long stride.

Rear teat placement

the position of the rear teat from the center of the quarter. 1 – outside, 5 - intermediate, 9 – inside of the quarter.



Final score: Is a composite score assigned based on 5 categories of linear traits. These are udders 40%, dairy character 20%, feet and legs 15%, frame 15% and breed characteristic 10%.

Source: *International Type Evaluation of Dairy Cattle (2005). World Holstein Friesian Federation, Paris*



Katoloni resource centre changing lives in Ukambani

Using ecologically sound farming methods, Katoloni Mission CBO has transformed the lives of thousands of farmers in drought-prone region.

Zipporah Ndulu | When 68-year old Regina Muthama started the Muuo Self Help Group to help uplift the living standards of rural women in Mikuyu village of Machakos county back in 2004, she did not know that she had just launched an initiative that would become one of the most successful CBOs in Ukambani region. Katoloni Mission CBO is an active non-government organisation in Ukambani region. The CBO has brought together 280 farmers' groups with more than 8,000 members who engage in various economic activities that are set to change the lives of thousands of people in this impoverished region that is prone to periodic droughts and famine.

Transfer of technology to farmers

When the Katoloni CBO was formed, it was looking for organizations that could assist the group achieve its target of helping farmers. Regina Muthama was the driving force for the entire project. The first institution the CBO contacted was KARI Katumani which was already working with farmers in her home area. Katoloni Mission CBO is one of the first groups that benefited from KARI's Agricultural Technology and Information Initiative (ATIRI) project whose aim was to transfer various agricultural technologies to farmers in an effort to increase production.

However, the fortunes of the Katoloni Mission CBO changed when the organization teamed



Regina Muthama the Katoloni Mission CBO coordinator, up with infonet-biovision information project that helped them set up a resource centre at the KARI-Katumani. The resource centre became an information hub that created convergence between the CBO, KARI and the farmers groups.

To improve information dissemination to farmers, the infonet-biovision project provided the CBO with information material that included laptops loaded with the infonet-biovision information content, posters and *The Organic Farmer* magazine. The project further recruited Community Information Workers (CIWs) who visit farmers and conduct training to address various problems and challenges facing farmers.

Using community video to pass information

The CBO Project Manager John Mutisya says the CIWs are also equipped with digital cameras and videos that help them document the various activities carried out by the farmers groups in various project areas. The pictures and video documentaries done in the local language help feature success stories of model farmers and

to explain how to do various tasks such as compost making, preparing plant extracts and soil conservation methods. The pictures and videos are then taken back to the community for viewing and further discussion among the groups in order to enhance the learning process.

The CIWs also conduct plant health clinics among farmers. They help farmers identify various diseases and pests that affect crops, and give advice to farmers on the remedies.

New donor funding to boost production

The activities of the Katoloni Mission CBO have attracted the attention of several donors who now support various projects they have initiated in the region. This is meant to help farmers improve production and protect the environment. Last year, the CBO made a project proposal to the EU's Community Development Trust Fund (CDTF). The donor gave them Ksh 23 million to implement various projects in environmental conservation, agroforestry, water and soil conservation.

Drought resistant crops introduced to farmers

Through its collaboration with KARI, Katoloni Mission trained farmers on drought tolerant crop varieties for maize, cassava, beans and sorghum. The project gets the seeds from KARI and distributes them to the farmers. The farmers grow the crops and give back part of the harvest, the same in quantity as the amount of seeds they obtained from the CBO, which are then distributed to other farmers. Through this method, the farmers get quality seed, enough food and additional income from the sale of the surplus harvest.



Katoloni CBO is engaged in brick making...



...agroforestry and tree nurseries for schools...



...fighting soil erosion.

The Katoloni CBO has diversified their activities to help farmers in the region practice sustainable and ecologically friendly agriculture, soil and water management tree nursery establishment, crop and livestock production, beekeeping, microfinance human nutrition and HIV/aids education and even human rights.

"The project will change the lives of thousands of people in this region in a big way," says Regina Muthama. "They now have enough food to eat and even sell. They have also learnt to produce food without external inputs and protect their environment by using ecologically sound farming methods," she sums up.

Radio programme now on CD
All programmes aired on *Mbaitu FM* in Ukambani in June 2013 are now available on CD. Farmers interested in the CDs can place their order from the TOF office, icipe. The CD will be sent to farmers free of charge. Call Lucy on 020 863 21 86.

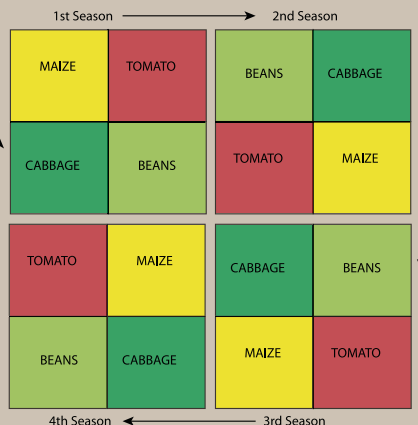
Rotate crops even on a small *shamba*

TOF - My land is very small; can I practise crop rotation?

Yes, you can. Rotation is not a question of farm size. If you have a small farm, it is even more essential that your crops are healthy. Healthy crops produce a bigger harvest, more food, and more cash. If you grow crops from different plant families every season, you can rotate them on your fields. Because maize and grains are less susceptible to diseases and do not need

to be shifted as often as vegetables, they can occupy a larger area of land set aside for seasonal crops, vegetables or fodder grasses. They can also be rotated with each other and with the maize.

Make a sketch of your farm, which shows all your plots and give them a name or a number, then buy a booklet and list for each plot the crop or intercrop you planted there. Keep this booklet well.



Poor management and nutrition cause infertility

I have a dairy cow, which I have for a number of years now implanted semen but cannot hold pregnancy. Kindly advice on what I can do.

Your cow must have an infertility problem. There are several causes of infertility problems in dairy cows. Broadly, they are classified in four groups:

The congenital causes include freemartins, i.e. twin birth of different sex calves (hermaphrodites). More than 90% of female freemartin calves are infertile due to freemartin abnormality. In this case, they are born with a problem of undeveloped female reproductive organ and therefore are always infertile. It is advisable to cull such heifers mainly due to this problem. Another congenital problem is the White Heifer Disease or segmental aplasia. This is simply the obstruction of the reproductive tract and is a common abnormality with white coat coloured heifers. Depending on the site of the obstruction, fertilization, conception and parturition (birth) may or may not be possible due to the fact that only one of the uterine horns may be affected. This problem is known to affect less than 5% of the total



Cattle need clean shelters for comfort.

(Photo: IN)

heifers. Similarly, it is advisable to cull such a heifer on the grounds of infertility.

Infectious infertility is caused by the disturbances in the reproductive function due to non-specific systematic infections. The most common infections include inflammation of the uterine lining, pyometra i.e. pus formation in the uterus, protozoal infection such as trichomoniasis, brucellosis, mycotic fungal infections and bacterial vibriosis. These conditions may be treated with specific drugs if identified at an early stage

of infection. However, they can also be quite stubborn and may cause culling of the infected animal if not treated on time.

Functional sub-infertility may be due to hormonal imbalances causing the following physiological malfunctions: Inactive ovaries, ovarian cysts and prolonged luteal function.

Management: Other causes of infertility are poor heat detection, use of low quality or expired semen, wrong insemination timing, poor herd administration and environmental factors such as poor nutrition

and lack of mineral supplementation.

It is important to note that the beginning of lactation starts when a cow calves down. To maximize milk production, dairy cows should calve down once every year. Prolonged calving interval caused by whatever form of infertility as discussed above should be adequately addressed. Most reproductive problems are caused by poor management and poor nutrition. Animal factors contribute a small part of reproductive infertility. The case of your cow requires the attention of a veterinarian. I suggest that you cull the cow and replace it with one that has been examined by a veterinarian.

William Ayako

Chickens vaccination

Can I vaccinate my chickens with any botanical plant juice?

No. If you are a professional chicken keeper and want to avoid losses, then you have to vaccinate your birds against the most common diseases. What you can do: Put some drops of aloe vera daily into the chicken's drinking water; this strengthens their immune system.

Plant teas improve and protect your crops

I heard on radio that one can promote plant growth with compost tea and plant extracts. Is this true or not?

The use of compost tea to promote plant growth has been tried by farmers all over the world. It is cheap and it works well. Heavy feeders or sensitive plants like tomatoes grow much healthier and fast when you spray them with compost tea or liquid manure made from plants such as nettle or comfrey. Do not forget that healthy plants are more resistant against pests and diseases!

Nevertheless, use of plant teas requires the farmer to spray or apply the teas using a can from plant to plant. *TOF* magazine promotes the use of compost tea and plant extracts and a number of farmers have benefited from use of liquid manure.

TOF has published at least 100 articles about the benefits of liquid manure and plant extracts, including how to prepare them. Since we have received a number of questions from new readers regard-

ing plant teas, especially from small-scale farmers in Ukambani, let us once more share a few tips on how to prepare these useful liquid manures.

Compost tea

Fill 5kg of well-composted farmyard manure in a cotton bag; put it in a bucket with 10 litres of water. Wait for 12 hours, and the compost tea is ready. It has a dark-brown colour and might not smell so good, but the plants will benefit from it.

Put the liquid in a can and apply it undiluted around every plant but not too near the root base. You can reuse the cotton bag, always ensuring that the liquid is brown.

Secondly, you can use this compost tea as foliar feed, but in this case, you have to dilute it. For every 1 litre of compost tea, add 20 litres of water and spray it over the leaves and stems of the plant. Wait for three weeks before harvesting vegetables to ensure the foliar feed has been absorbed completely and does not spoil the taste and flavor of the vegetables for consumers.



Comfrey



Stinging Nettle

Nettle or comfrey

Nettle is well known as a medicinal plant for human diseases like diabetes, inflammation and rheumatic pains etc. Additionally, nettle can be used for preparation of liquid manure, since the plant is rich in nitrogen and accumulates iron, calcium and magnesium.

Comfrey is an excellent source of potassium, an essential plant nutrient needed for flowering plants, seed and fruit production. Its leaves contain 2-3 times more potassium than farmyard manure, mined from deep in the subsoil, tapping into reserves that would not normally be available to plants.

How to make plant tea

Chop 1 kg of nettle/comfrey in 10 litres of water. Use a bigger bucket since the liquid might foam. Cover the bucket with a wiremesh (it should have enough air circulation and prevent any rodents from drowning in the solution). It is advisable to turn the liquid from time to time. After around 15 to 20 days, as soon as the remaining parts of the plant have sunk to the bottom, you can use it. For top dressing around the plant stems. You have to dilute it at a rate of 1 litre of plant tea to 10 litres of water. If you use it as foliar feed (to spray the leaves of the plants), you have to dilute it more, 1 litre of the solution to 20 litres of water.



Cassava, a substitute poultry feed

Due to high cost of cereal grains, cassava is a good alternative to cereals in feed formulation.

William Ayako | The poultry industry in Kenya relies on cereal grains and grain legumes as ingredients for feed formulation. Cereal grains such as wheat, barley, maize and sorghum are the main sources of energy in poultry feeds while grain legumes like soya, lupins and oil crop such as sunflower and cotton seed cake are the main sources of protein.

However, these ingredients are expensive and their availability is erratic. Moreover, their yields are often affected by rainfall shortage. The use of cereal grains in the biofuel industry in Europe and United States and the recent outbreak of Maize Lethal Necrosis Disease (MLND) in some parts of Kenya has prompted a search for alternative feed ingredients in Kenya and beyond.

Cassava is one of the most important food root crops in Kenya. Despite its high production in the coastal and Western regions of Kenya, its use is limited to human consumption. In Kenya, cassava is grown in over 90,000 hectares with an annual production of about 540,000 tonnes.

According to FAO reports, it is estimated that Africa produces about 42 per cent of the total tropical world production of cassava. The crop can grow in marginal lands, requires low input, and is tolerant to pests and drought. Use of cassava roots and other parts of cassava plant as animal feed is traditionally practiced by most farming communities in Africa and Asia. In Thailand, nearly all cassava produced is used for animal feed and starch production.

The starch industry in Thailand

produces a fibrous by-product known as cassava pulp, also called tapioca, which is used for feeding cattle and pigs. Unlike Thailand, cassava production is mainly for human consumption in Kenya and most countries in East and West Africa. In Kenya, cassava production has a huge potential in western and coastal regions and the support for cassava production is given priority by the Kenya Agricultural Research Institute as a key food security crop.

Recent research in Australia and UK has found cassava pulp to be useful in layer mash. It has also been discovered that instead of using maize, moderate amounts of cassava pulp can be introduced into layer feeds without affecting egg production and egg quality except for the yolk colour, which was paler for diets containing cassava pulp.

Benefits of cassava

Feed products from cassava include root chips and pellets, which are dried and ground. The cassava leaves can also be fed to chicken. These are dried and ground into a meal which is a good protein and carotene for chicken. Although rich in carbohydrates, cassava root products are low in protein and carotene. This means that the cassava-based diets need to be supplemented with carotene to maintain the egg yolk colour.

It may be necessary to give the chicken supplements that have microbial enzymes. This will enable the chicken digest the feed better and absorb the nutrients, it will also improve the yolk colour. Microbial enzymes are readily available from animal feed ingredient distributors and some agrovet shops in Kenya. Likewise, feed pigments are non nutrient additives incorporated in the feed to enhance egg yolk color to deep yellow. ■



farmers forum

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New offices for TOF and TOFRadio

The Organic Farmer magazine has shifted into new offices in *icipe* – African Insect Science

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