



Photo: TOF

Kenya has a huge potential for beef farming. However, large parcels of land that could be used for this purpose lie under utilised. Careful selection of the right breeds combined with good range management practices can transform the livestock sector and make Kenya a net exporter of beef. *Page 3*

Dear farmers

Kenya is once more faced with a looming food shortage. According to figures released by the Ministry of Agriculture, the country only managed to produce 33 million bags of maize against the projected output of 43 million bags. Agriculture Cabinet Secretary Felix Koskei says the country is likely to face famine between the months of June and August this year when the available maize stocks are expected to run out.

This is a very precarious situation for the country. Drought and famine are cyclic events in Kenya. The government should always be prepared for such eventualities to prevent suffering. Already, the images of starving people in Turkana district are horrifying.

What is even more worrying is that although the National Cereals and Produce Board (NCPB) is supposed to hold 4.4 million bags of maize in its Strategic Grain Reserve (SGR), it has only 2.2 million at the moment.

In the past issues of TOF, we have always advised farmers to do a market survey before going into commercial production of any agricultural or livestock enterprise. This is very important taking into consideration the current fiasco over quail farming. Most farmers had gone into quail rearing because it had become unsustainable to rear hybrid chickens due to high feed prices.

But misinformation that quail eggs and meat can cure ailments started spreading fast, followed by a price surge that has attracted hundreds of farmers into the business causing a glut in the market and a sudden drop in prices of quail eggs and meat. We would therefore advise farmers intending to go into quail production at the moment to be careful. They should only keep them for domestic consumption until such a time that prices stabilize.

Need to review maize seed policy

TOF - For many years, small-scale farmers in Kenya have become victims of fake seed purchase due to lack of information on the right seeds to buy. Many unscrupulous traders and middlemen have flooded the maize seed market. The counterfeiters collude with employees of seed companies, use stolen packaging material from the companies, dress and then sell the maize to unsus-

pecting farmers.

Maize seed regulated

Although seed companies are strictly regulated by the Kenya Plant Health Inspection Services (KEPHIS), trade in fake seed has affected the entire seed industry sub-sector in the country. This not only brings losses to farmers who get poor crop yields and less income after using such seed, but it also compromises the country's food security.

Unmet demand

The Government has done well in subsidising the cost of seeds through the Kenya Seed Company, a state Corporation, but unfortunately, the company does not seem to produce enough of the popular varieties that farmers need. One such seed variety is H614D, with a 60% market demand from farmers owing to its good characteristics.

As a result, the H614D has become the most abused seed variety in the country especially by black market seed cartels. The businessmen monitor the seed shortage then obtain Kenya Seed Company packaging material and package them with commercial maize that is

later sold as H614D. Counterfeit seeds are also common with other varieties.

Good varieties neglected

The Kenya Agricultural Research Institute (KARI) has developed some of the best maize seed varieties in the country (including KH600-14E, an improvement of H614D) that are even better. One wonders why a state corporation such as Kenya Seed Company cannot multiply such seed varieties for farmers. Clearly, this is a policy



issue that should be addressed by the Ministry of Agriculture.

Farmers also need information on new and alternative maize seed varieties in the market that do well. In this issue we have featured some of the varieties that farmers in different parts of the country can plant instead. *Page 4 and 5*

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Farmer discovers the value of Canola

Canola is one of the healthiest edible oils in the market today. It was developed from rapeseed using traditional plant breeding techniques.

Musdalafa Lyaga | Fifty eight year-old David Kimondo, is a farmer from Mweiga, Kiini West district of Nyeri County. Several years since he started growing canola, he is now smiling all the way to the bank, thanks to a plant which many farmers consider a weed.

Canola resembles *sukuma wiki* (kales) and is also known as rapeseed. It is used to produce a highly nutritious vegetable oil when pressed, which is increasingly finding its way into Kenyan kitchens. It is ranked highly worldwide as one of the best edible oils. Canola requires 400 - 500mm of rainfall and combines well in beekeeping since bees are attracted by its sweet scent. The canola farmer says that an acre can produce up to 2 tonnes of seeds, which provide slightly more than 500 litres.

Discovered by chance

Kimondo discovered canola oil almost by chance: "I thought canola is a weed that is used to feed cows but I never knew it



could be a source of income," he says. He had gone to purchase a goat from a farmer at Naromoru, who explained the value of the plant.



Photo: IN
Canola crop under large scale production in Western Australia

Oil and cake for animal feed

"I was not only challenged by what I saw but I was also excited at the prospect of extracting oil from the seeds and selling the byproduct - canola cakes - to farmers who use it as cattle feed."

Canola cake is a highly nutritious livestock feed. Kimondo says that farmers buy canola cake from him, mix 3 kilograms of canola cake with 70 kilograms of animal feed as a food supplement for cattle, chickens and rabbits and other farm animals. Today, Kimondo produces up to 100 litres of oil in a day. He sells 1 litre of the oil at Kshs. 200 but says he cannot meet the rising market demand. He has encouraged other farmers to grow and sell to him, so that together they can meet the local demand for canola oil.

Canola is improved rapeseed

According to Mr. Kimondo, canola is a low maintenance plant, which matures after three months. It is mostly used in crop rotation to preserve soil fertility. Some of the pests that attack the canola plant include aphids, which are controlled by spraying insecticides.

Canola oil has its roots in Canada and the name canola is

actually an acronym for "Canadian oil, Low acid" (Canola) was originally a registered trademark but the trademark was eventually abandoned and the term canola adopted. Initially, the acids in the rapeseed made the plant unsuitable for human consumption or for animal feed. After improvement through breeding, canola became safe for use as cooking oil. The byproduct (cake) is also used for animal feed.

Canola is not a GMO

There are claims that Canola is genetically modified. According to Mr. Mike Adams the editor of Natural news.com, Canadian agriculturists used traditional breeding techniques to develop a new type of the rape seed plant that had only trace amounts of erucic acid.

Mr. Kimondo says that the road to embracing canola agribusiness has been full of challenges. Even though he owns a popular local restaurant where the locals buy chips, chicken, chapati and rabbit meat fried in canola oil, he had to overcome many challenges.

Birds compete for Canola

Birds enjoy the canola

seeds and eat up the produce in the farm. As a result, some farmers tie nets around the plants to protect them from damage by the birds. "I try to plant more seeds so that I am left with some harvest after the birds have had their share," he says. The canola farmer is appealing to organizations and research institutes to come up with ways of helping the farmers to deal with the birds.

Consumers discovering Canola

Another challenge that Kimondo faced was accessing the market, which is flooded with many cooking oils. He had to convince people to start using canola oil, which has immense health benefits.

The market was slow to embrace the canola oil in spite of its nutritional benefits. As people started embracing canola oil and demand increased, Kimondo faced another challenge. He could not satisfy the demands in the market, which had risen sharply and decided to lease one acre to grow the seeds, which was hardly enough to meet the market demand. He has encouraged and sensitized farmers to improve their livelihoods by planting the rapeseed to tap into the rising demand for the product. He buys canola seeds from farmers as far as Laikipia and has selling points for canola oil in as far as Meru.

Mr. David Kimondo can be contacted on Email: kienimaizemillers@yahoo.com. Tel: 0722 550 053.



Photo: IN
A Canola oil plant

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Kenya has a great potential for beef farming

With about 80% of Kenya's landmass being arid and semi-arid, beef farming is a viable way of using land, which would have otherwise been left to lie fallow. In this issue, TOF provides insights on rearing Boran cattle for beef. We hope this will help farmers to take advantage of the available opportunities in beef farming.

Josphat Chengole | Reliable feed and water are the major challenges in beef farming. Fodder is usually plentiful during the wet seasons and limited during the dry season. At the same time, the natural pastures that support most of the livestock production in the Arid and Semi-Arid Lands (ASALs) are being degraded due to poor management systems. During the wet season feed is plentiful and often exceeds the demand, resulting in waste. In the dry season and drought spells, the demand for fodder exceeds the supply. To keep their animals in good shape throughout the year, beef farmers must conserve fodder by making hay and



A four month old Fleckvieh/Boran cross suckling at Olooltepes ranch. Source: Fleckvieh Genetics East Africa

silage from grasses, sorghum and maize, practice rotational grazing and also keeping a manageable number of animals.

Take advantage of hybrids

Farmers and pastoralists should improve their cattle through breeding. Cross breeding beef cattle tends to improve production by increasing rate of growth, feed conversion, and amount of muscle, which translates into more meat. Farmers,

however, need to be careful when choosing the kind of bulls to breed with their cows for purposes of getting beef cows with better qualities and which fetch better prices in the market.

The new breeds that have come into the market have better production advantages over and above the average of the two parent breeds. To be of economic advantage, the cross breeds need to have better traits of either parent strain or breed – otherwise you are better

off sticking with the superior parent line. Therefore, farmers need to be careful when they are choosing the kind of bulls to breed with their beef cows.

TOF will give you a serious of articles on beef farming which is hoped will improve the level of knowledge and awareness that will enable you to take advantage of the huge opportunities in beef farming. In this issue, we look at the Boran breed of beef cattle

Boran, the ideal beef cow for arid areas

The Boran is the perfect beef cow, especially for grazing systems in arid areas. It is able to convert roughage from natural grasses into high quality beef, while remaining resistant to tick borne diseases. Most of the big ranches in the country rear this excellent animal. According to the Boran Cattle Breeders Society, the Boran cow is liked by farmers for its ease of calving and ability to maintain 365 days calving interval – a calf every year.

The Boran is generally white in colour with dark points and pigmented black skin. It is also common to see brown Boran with dark points around the neck, the backside, and around the hump. The Boran bull has loose, thick and flexible skin and a dark pigment with fine short hair for heat tolerance.

Weight: At birth Boran calves weigh about 28kg for males and 25kg for females. Mature cows are medium sized averaging a live weight of 350 - 400kg, with great mothering skills. Mature



A Boran bull (left) - ©vasrapboran

bulls can weigh 500–800kg, with carcass ratio of 52%. Bulls are generally docile, which makes handling them easy.

Crossbred: With proper feeding and care Boran crossed with exotic breeds, Charolais, Aberdeen, Angus and Sim-

mental achieve high weaner weights of 300kg. Boran calves weigh about 25kg at birth.

Output: Animals reared on grass are usually ready for the market in about 3 years with around 450 kg live weights. Those on supplementary

feeding systems are ready by slightly less than 2 years, with 400kg live weight.

Survival: Boran have good feet and leg conformation; hence, they are able to walk for long distances. The dark pigmentation around the eyes lessens the occurrence of pink eye infections.

Longevity: Boran cows live for long, and it is normal to find breeding cows that are 15 years old.

Note: Semen from Boran bulls is available locally courtesy of Kenya Animal Genetic Resources Centre (KAGRC). Inquire from distributors in your area. Or, send your email by SMS to 0715 916 136 and the list will be sent to you via email.

Be careful when buying maize seed this season

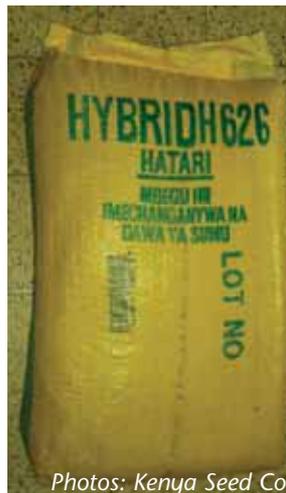
A lot of seed being sold in the market is not genuine. Farmers can avoid buying fake seed if they can take a few steps to verify the quality of seed before making any purchase.

Peter Kamau | For optimum crop production, selection of the right inputs is very important. One of the most important inputs for the farmer this season is maize seeds. A good knowledge of the right seeds for the various climatic regions enables farmers attain a good yield and income. Due to the high demand for maize seeds, farmers fall prey to people who offer cheap seeds, claiming they are genuinely obtained from seed companies. Others buy seeds from any stockist without verifying the source and even quality of the seeds.

Check for seed licence

Farmers should know that a lot of seed being sold by most stockists in major towns in the country are not genuine. The best way to establish if the seeds are genuine is to check if the shop is licensed to sell maize seeds by the Kenya Plant Health Inspection Service (KEPHIS). Farmers should also look for the inspection service tags that are put in every seed package (see tips bottom right).

The sale of fake seeds causes huge losses to farmers who record reduced yields and income. Efforts to curb the vice by the KEPHIS and law enforcement agencies have not been entirely successful because it is practised by a network of prominent traders who collude with some seed company employees. Two years ago, police and



Photos: Kenya Seed Co.

To a farmer, the above two seed packages may appear the same but the seed package on the left is genuine and one on the right is fake

KEPHIS inspectors raided a major supermarket in Kitale town where a large consignment of fake seeds was confiscated and the owners of the supermarket arrested. But trade in fake seeds continues despite the arrest of individuals involved in fake seed business cartels.

Packaging bags stolen

In a separate incident, a lorry belonging to Kenya Seed Company that was transporting thousands of seed packaging bags to Kitale was hijacked in Naivasha town in the same period and the driver killed. The company says that the packages have not been recovered to date, an indicator that farmers still face the risk of buying fake seed packaged in genuine seed bags if they are not careful when buying their maize seed. (See TOF no. 93, February 2013)

Seed producers also cheat

Farmers contracted by seed companies to produce maize seed have also been involved in sale of uncertified maize seed.

The KEPHIS inspectors may condemn the maize if it does not meet the quality standards, and



Photo: TOF

Dressed maize seed

thereafter advise the farmer to sell it as commercial maize. But some unscrupulous seed producers end up selling the maize to middlemen who then sell it to unsuspecting farmers, claiming it is genuine seed obtained from seed producers. To sweeten the deal, the seed merchants offer it at a cheaper price compared to

that of genuine seed. The seed, also called "dubai" seed cannot do well when planted. Farmers who fall prey to such tricksters end up with a poor harvest.

Commercial maize is not seed

Some farmers have opted to use commercial maize as seed. Such maize cannot produce the desired yield. This is responsible for the low yields that farmers get when they plant it. Farmers should know that maize seed is produced in a special way that enables it to produce more when it is planted. After it is harvested, it cannot be replanted as seed because it does not have the characteristics of maize seed.

Ordinary maize that is replanted as seed also has a tendency of transferring diseases and pests such as leaf inflammation, stalk and the Larger Grain Borer. Unless farmers take other measures to identify genuine seed (See guidelines below), it is very difficult for them to distinguish genuine seed from fake seed because in most cases, the fake seed is treated with the same chemicals and packaging material as genuine seed.



Photo: IN

How to identify the right seed during purchase

Before buying any seed, the farmer should consider the following guidelines in order to minimize incidences of purchasing fake seed and to increase their maize yields:

- Buy your seeds only from licensed seed stockists or shops. Before buying the seed, it is important to ask to see the licence issued to the stockist that authorizes them to sell seed. Alternatively, ensure you buy seeds from reputable and well-known agrovet shops in your nearest town.

- All genuine seeds have company tags and inspection labels from KEPHIS in inside the seed bags. It is always important to check for the tag immediately

you open the seed bag to ensure the seed is genuine.

- Buy your seeds early enough, say in December or January. We have realized that farmers are more likely to buy fake during the rush for seeds in February, March and April when most of the popular varieties of seeds are in short supply.

- Always ensure the seeds you are buying are not expired. Some stockists who buy large quantities may continue selling carry-over stocks remaining from previous years; such seeds cannot grow well when planted and may fail to germinate.

- All seeds should be well stored preferably in a cool and dry place.



Photo: IN

Maize seed in a research facility: A lot of research goes into the development of maize seed varieties before they are released to farmers.

What to do when selecting maize seed

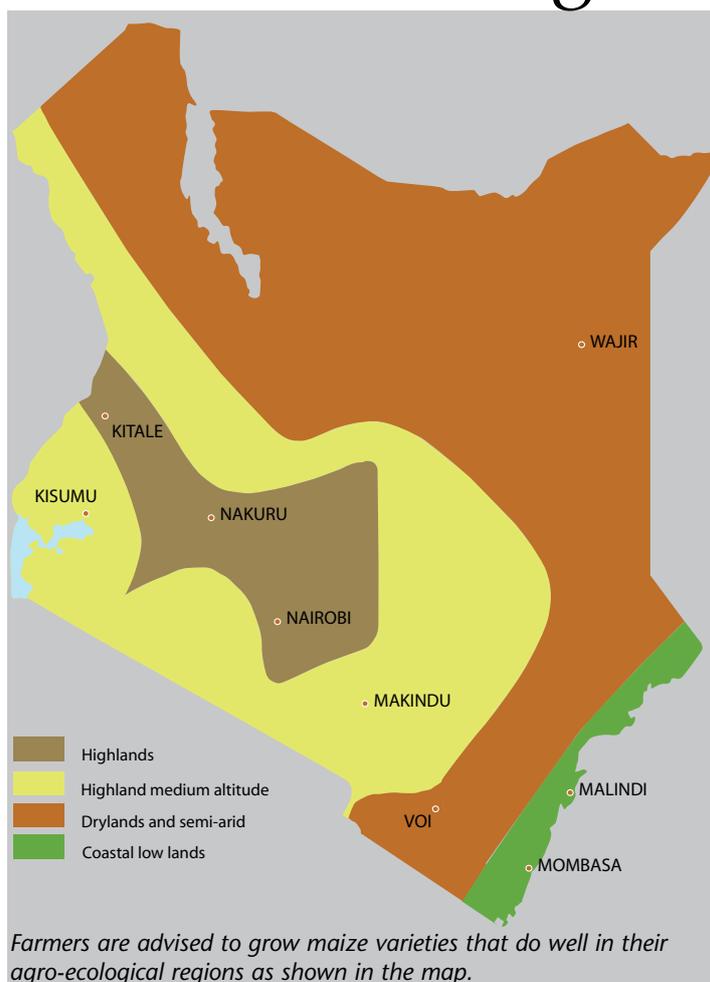
Isolate a small portion of land whenever you want to try a new maize variety. Plant and observe it and only go into full production when sure that the variety can do well in your region.

Peter Kamau | Every year, many farmers plant the wrong maize seed varieties, ending up with poor yields for lack of correct information. Persistent advertising and promotion of certain maize seed varieties by seed companies is partly to blame for the problem. Another problem is that farmers usually ask local agrovet shops to sell them the best maize varieties. This approach is not effective because seed stockists will always recommend any variety especially that of stock that is not moving.

Farmers should therefore be very careful when choosing maize seed varieties to plant. The seeds are developed on the basis of altitude, rainfall, type of soil and temperature and other climatic conditions. To meet the needs of farmers in every climatic region, researchers have developed seed varieties that do well in those regions. It is therefore important for farmers to buy seeds that can do well in their geographical regions. It is also important that farmers seek for advice from extension officers, agricultural or research institutions before buying any maize seed.

Before adopting any new seed variety, it is important that farmers isolate a small portion of land, plant the variety and observe its characteristics. Check if the variety is prone to lodging (falling due to wind), if the ears open early before maturity, which allows water and rotting, the yield and any other negative characteristic. When you have established that the variety is good, proceed to large-scale production. We give this advice to caution farmers against buying new seed varieties (which may not have the desired qualities) as may be claimed by seed companies or seed stockists.

Good management of maize through the production phases is important. Low soil fertility, soil acidity, late land preparation and planting, poor weeding and even using the wrong plant-



ing methods can contribute to low maize yields. Below, we provide farmers with some of the new and alternative maize seed varieties:

High altitude varieties

High altitude varieties (Rainfall 1000-1500 mm, Altitude 1700-2300 m)

Variety: ADC 600-23A

Company: Agricultural Development Corporation (ADC)

Qualities

- Average yield 43- 68 bags per acre.
- Sweet in taste.
- It does not fall easily (no lodging).
- It produces a double cob.
- It is resistant to rust.
- Resistance to leaf blight.
- Resistant to Grey Leaf Spot.
- Out yields H614D by 43.3%.

Suitable growing areas: Trans-Nzoia, Uasin Gishu, West Pokot, Keiyo, Marakwet Laikipia, Nakuru, Kisii, Kiambu.

Variety: KH600-14E
Company: Freshco
(improved H614D)

Qualities

- Average yield 45-50 bags.
 - Sweet to taste.
 - Flinty shape (not easily attacked by weevils).
 - Has excellent husk cover (does not open ears, which causes rotting).
 - Tolerant to Grey Leaf spot disease.
 - Heavy (like original H614 variety).
 - Droops at maturity.
- Outyields original H614D by 13.3%.
- Matures earlier than H614D (by 1 week).

Suitable growing areas: Trans-Nzoia, Uasin Gishu, West Pokot, Keiyo, Marakwet Laikipia, Nakuru, Kisii, Kiambu.

Variety: KH 600-15A
Company: East African Seed

Qualities

- Yields 33-47 bags per acre.
- Matures in 145-148 days.
- Has good husk cover.
- Very good standability.
- Out yields 614D by 10.1%.
- Droops (cob faces down) on

maturity preventing grain rot.

- Tolerant to GLS, Maize Streak Virus and blights.
- Produces double cobs.

Suitable growing areas: Mt. Elgon slopes, Trans-Nzoia, West Pokot, Uasin Gishu, Nandi, greater Kericho, Taita, Nyeri (upper parts), Laikipia, Lower Nyandarua.

Variety: KH600-16A
Company: Freshco

Qualities

- Yields 35-50 bags per acre (out yielding H614 D by 16.7%).
- Matures in 140-180 days.
- Very good standability.
- Tolerant top Grey Leaf Spot (GLS), leaf blight.
- Has a good husk cover (will not rot in heavy rains).
- Droops when dry (will not rot in heavy rains).

Suitable growing areas: Trans-Nzoia, Uasin Gishu, West Pokot, Keiyo, Marakwet, Laikipia, Nakuru, Kisii, Bungoma, Mt Elgon, Kiambu.

Variety: 600-15A,
Company: East African Seed

Qualities

- Yields 35-45 bags per acre.
- White semi-flint grains.
- Has very strong stalk and does not fall easily (good standability).
- Maize cob droops when dry, reducing rotting.
- Has good husk cover.

Suitable growing areas: Mt. Elgon slopes, Trans-Nzoia, West Pokot, Uasin Gishu, Nandi, greater Kericho, Taita, Nyeri (upper parts), Laikipia, Lower Nyandarua.

Kenya Seed Company: The most popular seed varieties from the company for high altitude zones include: **H614D, H6213, H629 and H628**. H6213 can do well under a high level management.

Medium altitude varieties

(Altitude: 1200-1600m Rainfall: 800 mm and above)

Variety: WH507

Company: Western Seed Co.

Qualities

- Average yield 35 bags per acre.
- It matures in 4 months (120-135 days)
- Good for green maize (remains green longer).
- It has a big cob.

Suitable growing areas: Western Kenya- Kakamega, Bungoma, Busia, Kisii, Nyanza Region- Homa Bay, Suba, Migori Rongo, Siaya, Bondo; South Rift- Tinderet, Nandi, Kericho, Bomet, Narok, Sotik, Trans-Mara; Central Province- Muranga, Kiambu, Kirinyaga; Eastern Province- Embu, Meru, Machakos, Kitui, Mwingi etc.

Variety: **KH 500-33A**
Company: Freshco

Qualities

- Average yield 35–40 bags per acre.
- Matures in 4 months (120–140 days).
- Good standability.
- Resistant to Maize Streak Virus (MSV) and smut disease.
- Flinty white grain (resists weevil damage) tightly packed.
- Large cob and stalk.
- Good taste as green maize when roasted.

Suitable growing areas: Western Kenya- Kakamega, Bungoma, Busia, Kisii; Nyanza Region- Homa Bay, Suba, Migori Rongo, Siaya, Bondo, South Rift- Tinderet, Nandi, Kericho, Bomet, Narok, Sotik, Trans-Mara; Central Province- Muranga, Kiambu, Kirinyaga; Eastern Province- Embu, Meru, Machakos, Kitui, Mwingi etc.

Variety: **WH505**,
Company: Western Seed Co.

Qualities

- Average yield is 30 bags per acre.
- Maturity is 4 months (120- 150 days).
- Tolerant to drought.
- Tolerant to most leaf diseases.

Suitable growing areas: Western Kenya- Kakamega, Bungoma, Busia, Kisii; Nyanza Region- Homa Bay, Suba, Migori Rongo, Siaya, Bondo, South Rift- Tinderet, Nandi, Kericho, Bomet, Narok, Sotik, Trans-Mara; Central Province- Muranga, Kiambu, Kir-



Photo: JN

inyaga; Eastern Province- Embu, Meru, Machakos, Kitui, Mwingi etc.

Variety: **KH 500-13A**
Company: Freshco

Qualities

- Average yield is 35-40 bags an acre.
- Maturity 4 months (120–140 days)
- Tolerant to MSV, leaf blight and leaf rust.
- Good stalks for cattle feed.
- Good standability.

Variety: **WH 403**,
Company: Western Seed

Qualities

- Average yield is 30-35 bags per acre.
- Good husk cover.
- Does not lodge (fall due to wind and weight).
- Maturity 4 months (120-135 days).

Suitable growing areas: Western Kenya- Kakamega, Bungoma, Busia, Kisii, Nyanza Region- Homa Bay, Suba, Migori Rongo, Siaya, Bondo, South Rift- Tinderet, Nandi, Kericho, Bomet, Narok, Sotik, Trans-Mara, Central Province- Muranga, Kiambu, Kirinyaga, Eastern Province- Embu, Meru, Machakos, Kitui and Mwingi.

Variety: **WH 402**,
Company: Western Seed

Qualities

- A superior hybrid seed.

- Average yield is 40 bags per acre.

- Slightly tolerant to Maize Lethal Necrosis (MLN) disease.

- Maturity 4 months (130-160 days).

Suitable growing areas: Western Kenya- Kakamega, Bungoma, Busia, Kisii, Nyanza Region- Homa Bay, Suba, Migori Rongo, Siaya, Bondo, South Rift- Tinderet, Nandi, Kericho, Bomet, Narok, Sotik, Trans-Mara, Central Province- Muranga, Kiambu, Kirinyaga, Eastern Province- Embu, Meru, Machakos, Kitui, and Mwingi.

Kenya Seed Company: Popular varieties from the company for medium altitude zones include: H624, H524, H525 and H526. Others varieties include H513, H515, H516, H517, H518, H519, H520, H521 and H522.

Dry land Varieties

Dry land varieties mature within 90-120 days. These perform well in arid and marginal areas with a mean annual rainfall of 200-500mm. The most suitable varieties for these regions are **DH01, DH02, DH03 and DH04** (Kenya Seed Company) **KDV-1 (OPV), KDV-6 (OPV)** (FRESHCO) areas where the varieties do well include Taita Taveta, Mwatate, Lamu, Mpeketoni, Homa Bay, Rongo, Unguja and Siaya.

Striga resistant varieties

Some areas in medium altitude zones have striga, a parasitic weed that chokes maize plants

reducing their ability to produce maize. Striga-resistant varieties have been developed to overcome the problem. One of the varieties that is striga resistant is FRC 425R (FRESHCO) which produces 30-35 bags an acre. Another suitable variety is WH 303 (IR) from Western Seed co.

Important maize planting tips

In order to get a good maize crop, farmers need to go by the following planting tips:

Land preparation: The land to be used for planting should be prepared early enough.

Planting: Planting should be done early preferably two weeks before the rains stop. Maize planted after the rains have started cannot germinate well because the soil temperatures tend to go down as the rains persist.



Most farmers practise. Dry planting (planting when the rains have not started); in this case the germination tends to be vigorous. Research has shown that if a farmer plants two weeks after the onset of the rains, they lose an average of 2½ bags of maize per acre per week. Maize that is planted early also benefits from nitrogen flush – this is a process where the newly planted maize benefits from nitrogen fixed into the soil from the atmosphere at the onset of the rains before it is lost through leaching.

Spacing: It is important to space your maize correctly. There are two spacing options:

- 75x30cm when planting one seed per hole.
- 75x60cm when planting 2 seeds per hole.

Always plant certified seed to get a good maize harvest.

Important contacts for seed companies in Kenya

Farmers should get in contact with the following seed companies incase they need to make any enquiries regarding maize seed available in various parts of the country.

1. Agricultural Development Corporation
Head Office: 020 2250 695,
020-2250 185, 0724 930 920, 0734 930 920
Nairobi, Email info@adc.co.ke
Kitale office: 054-208 11, Email: ktl@adc.co.ke

2. Freshco Seed Company Ltd
020 232 4 797, 0712 110 849, 0723 108 969,

Email: info@freshco.co.ke

3. Kenya Seed Company Ltd
054 31 909-14 Kitale,
Email: info@kenyaseed.co.ke

4. Simlaw Seed Company Ltd
020 221 5066/67/83
Email: adm@simlaw.co.ke

5. Western Seed Company Ltd
054 3022, 054 30 994, 0720 897 860
Email. sales@westernseedcompany.com

6. East African Seed Company Ltd
020 652 101, 020 652 102, 020 652 103, 020 652 104,
Email: info@easeed.com

Importance of green manures in organic farming

What green manure crops are most beneficial to farmers?

Green manures are plants grown as food for people and feed for animals while improving the soil. The plants may fix nitrogen, protect soil from drying, improve soil structure through the roots and suppress weeds since they grow fast. Green manures can also control pests since they create a habitat for predators. The plants can be ploughed back into the soil or cut and left to be used as mulch later.

Green manure plants

Examples of green manure plants include purple vetch, calliandra, leucaena, mucuna, lucerne, desmodium. Legumes such as soybeans, green grams, groundnuts and pigeon peas, cowpeas etc. All plants require nitrogen to grow; plants get the nitrogen from the soil and store it in their leaves, stems and roots.

The main advantage of legumes is that they can capture their own nitrogen from the air and fix it into the soil. When intercropping, it is very important that farmers use green manure plants as they increase the amount of nitrogen in the soil. Research conducted by KARI shows that legumes such as mucuna, lablab, croton and canavalia planted alone can add 35 – 150kg of nitrogen into the soil per hectare.

Coconut waste is good in compost making

Can I use coconut coir in place of cow dung (farm yard manure)?

Coconut coir is a natural fibre extracted from the outer shell of coconut husk. It has a natural pH which enables plants to grow in a way healthy way. Coconut coir is free of bacteria, plant diseases, fungi, weeds and other pathogens that interfere with plant growth. The coconut coir is mainly used as a soil additive; due to its structure, it provides plants sufficient space for air circulation while maintaining excellent water retention capacity, which prolongs the lifespan of the soil and slows down the decomposition process. It also helps to absorb water, keeping the soil moist and fertile. If the soil is sandy coir helps to reduce moisture loss by keeping moisture close to the plant roots. In clay soils, coconut coir creates air spaces in the hard packed soil so that



Calliandra



Leucaena



Purple vetch

How does the composting process take place?

Compost is the product resulting from the controlled biological decomposition of organic material. Compost is made through a natural process where organic matter is broken down to form humus. The composting process provides an excellent source of nutrients for replenishing the soil. It offers a cheap way of ensuring soil fertility management without the need for use of expensive external inputs such as chemical fertilizers.

Material needed in compost making

The requirements for composting are the presence of soil microorganisms and organic material such as animal manure (farm yard manure) crop



A bean plant sprouts in coconut coir medium.

nutrients air and moisture can be well distributed.

Farmyard manure or cow dung on the other hand contains essential organic matter and nutrients that the soil needs for proper plant growth. Therefore, we would advise you to use both coconut coir and farmyard manure when making compost as the two will combine to produce high quality compost that you can use to grow many crops.

remains or residue, municipal garbage, kitchen waste, hedge trimmings, and weeds, which do not have seeds. Moisture must also be present to speed up the decomposition, and temperature control to optimize microorganism activity and aeration of the soil to provide adequate oxygen for the decomposition process. The composting process has three stages:

a) **First stage**-(mesophilic phase)- At this stage, microorganisms present in the organic waste and the air start breaking down the compost material- as this happens, heat is produced and the temperatures of the compost heap rises; the pH of the material falls as organic acids are produced.

b) **Second Stage** (thermophilic stage)- As the temperatures go beyond 40°C – 60°C, all the fungi in the compost heap are eliminated and are no longer active. However the reaction goes on reaching a point where the sugars, starches fats and proteins in the compost heap are used up. The reaction starts slowing down as the ammonia gas is released.

c) **Third stage** (cooling down phase)- At this stage, the rate of reaction decreases as the heap enters the cooling down phase. As the temperature falls, fungi and other microorganisms reinvade the compost pile. The compost heap starts maturing and any remaining organic material is broken down to produce humus and humic acid. At this stage, the farmers should be able to turn the compost frequently to speed up the process. During this stage, there is an intense competition for food among the microorganisms. Other small insects such as mites, ants, earthworms and other soil worms invade the compost and break the organic material further.

Composting should be a

continuous process on the farm depending on the availability of composting material. Farmers are advised to prepare compost when there is plenty of such material on the farm. Such compost can be stored for use when it is needed. It should be kept covered with a polyethylene sheet, banana leaves or any other vegetative material until it is needed for application in the *shamba*.

Will a soil test help me to know the problem with my plants?

It depends on what problem your crop may be having. If it has to do with nutrient deficiencies, a soil test will help you to determine which plant nutrients are missing in the soil or which ones are in excess in terms of quantities required. You should know that different plants take different nutrients from the soil. For example, the nutrient requirements for a crop like beans are different from that of maize. Some crops such as maize, potatoes or sugarcane are heavy feeders- it is therefore important to test the soil after every two or three years if you are planting them on the same land again and again (monocropping) since they tend to take a lot of nutrients from the soil. Practicing crop rotation together with other organic farming practices can help maintain nutrient balance in the soil and reduce the need to test your soils often (TOF No.105, January 2014).

Which is the best time to test your soil?

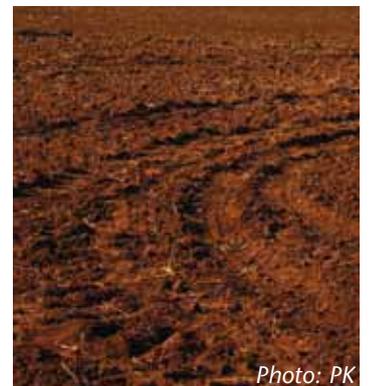


Photo: PK

Soil tests should be done at the beginning of every year; this means that before the desired crop is planted, it is important to know the nutrient lacking in the soil to enable buy or use appropriate fertilizers that will help your plants to grow healthy. Always indicate what crop you intend to grow when taking a soil sample to enable the scientists advise you accordingly. TOF

TOFRadio answers your questions

TOFRadio: TOFRadio is broadcast on Milele FM at 8:30pm on Tuesday, and KBC on Thursday at 8:15pm. Tune in and listen to farmer experiences and expert advice on agribusiness and eco-friendly farming methods. On this page, we respond to some of the issues raised by farmers in their correspondences to the radio program. Send your questions and comments via SMS 0715 916 136.

Lablab is good for food and fodder

Lablab is a source of protein for both humans and livestock. The legume improves soil fertility, is suitable as a cover crop and can be rotated with other crops.

John Cheburet | Forage legumes are important because they improve soil fertility through nitrogen fixation, have high crude protein in the leaves and foliage. They are rich in minerals (calcium, phosphorus) and vitamins (A and D complex).

Dolichos (*Lablab purpureus*) popularly known as *njahi* is a short-lived perennial or annual legume cultivated as human food, green-manure cover crop and animal fodder. The young green pods and immature seeds are boiled and eaten. Locally, the young leaves are used as a leafy vegetable. The dry seeds are eaten as a pulse although they require prolonged cooking with several changes of water.

As animal fodder the whole plant is used as a fodder for cattle, either green or hay or



silage. The stems are stronger and more fibrous than cowpea, and animals tend to eat the leaves only and leave the stems. It is an adequate source of the much-needed protein and can be used in different ways; it can be grazed directly, as a companion crop to maize, cut as hay, or mixed with maize. Lablab hay is fed to animals to supplement poor quality maize stalks and hay.

Dolichos has several advantages: It provides better late season grazing and has better compatibility with forage sorghum or maize when intercropped. It gives high yields of materials for conservation. Its dry matter yield is usually higher than for cowpea, particularly under drought conditions. It grows well on acidic

soils and has better disease resistance, not easily attacked by insects such as beanfly.

Seedbed preparation: Dolichos has a large seed and therefore does not require fine seed bed as that of lucerne. Highest yields are obtained on land that has not been cultivated previously (fallow land).

Planting: Space at 45cm between rows and 30cm from plant to plant (placing 2 seeds per hole). Place seed at a depth 5-7cm (or middle finger length) and cover gently and properly if erratic showers (rain) occur. Use 25kg seed of dolichos per acre. Use well matured compost at the rate of two handfuls per hole. For better results, inoculate with Biofix.

Management: Harvest for fodder at an interval of 6 weeks leaving a stubble height of 15cm from ground level. Remove weeds whenever they appear. To get optimal yields in terms of quantity and quality, harvest at early flowering stage.

Utilization: Dolichos can be conserved into hay or silage. It can be fed green to dairy cattle or as a legume supplement.

Note: To get certified dolichos (*Njahi*) seeds, contact your nearest KARI centre. Varieties include DL1002, DL1009 and Rongai. Biofix can be obtained from all Mea Ltd. Branches in the country. ■

Pasture varieties suitable for beef animals

Here are some of the grasses that are used for grazing and feeding beef animals. The list will be continued in future editions of TOF;

Fox tail grass (*Cenchrus Ciliaris*): It is nutritious grass often used to fatten beef animals. It is the most tolerant of the sown grasses, perennial, matures fast and has multiple benefits. It is used as a permanent pasture for grazing, for making hay or silage. It is established from seed, mainly during the rainy season. It responds quickly after rain. Studies in Baringo County have shown that the invasive tree *Prosopis juliflora* can be replaced by pasture grass *Cenchrus ciliaris* and provide the

much needed fodder for beef cows.

Rhodes grass (*Chloris gayana*): Elmba, Pokot and Mbarara Rhodes are best suited for beef farming areas as they are relatively drought resistant. It has soft and excellent herbage, high forage yield and suited for a wide range of climatic conditions. It grows quickly and hence suited to intensive grazing. It is sown directly into open ploughed land or can also be sown under maize and sorghum. Whereas Rhodes is used for direct grazing it is preferred for haymaking. Rhodes grows fast and can be grazed 4-6 months after planting. With good fertilization, its highest production is reached in the second year.

Fodder sorghum: Sorghum is

resistant to drought and grows well in dry areas. Sudan grass and Columbus grass are recommended for the drier areas. Fodder sorghum is best utilized by cutting. Do not graze sorghum before it has reached 6 weeks to avoid prussic acid poisoning. Also, do not graze the animals directly. Cut and leave the fodder to wilt for up to 4 days before feeding in combination with other grasses. The best option is to use it for making silage and hay for use during the dry season. This way, prussic poisoning is eliminated.

Note: Seed for Rhodes grass is available at Kenya Seed Company stockists. For *Cenchrus Ciliaris* and Fodder sorghum seed, get in contact with the nearest KARI centre.



farmers forum

0717 551 129 / 0738 390 715

Hay wanted: I would like to buy 270 bales every week. Anyone able to supply can contact me on 0721 985 438.

Land for sale: 1½ acres of land, 3 kilometres from Kagumo town opposite Royal Academy with 360 coffee bushes, 380 grevillea trees, a zero-grazing unit with a capacity for 15 cows, a chicken house with a capacity for 2000 layers or 3000 broilers rabbit cages, 8 dairy goat cages, 6 bee hives, a borehole with electric motor, 6000 litre water tank, a 3 bedroom house. Call 0722 460 066.

Cream separator for sale: Suryoday cream separator as new, in good working condition, complete with operation manual Ksh 46,000. Highest offer secures. Call 0734 913 049 from 8 - 5am.

Indigenous tree seedlings: We would like to buy indigenous seedlings. Contact us on 0725 104 591.

Guinea fowl wanted: I am interested in West African guinea fowl which are bigger in size compared to the local ones. Call me on 0724 873 849.

Fruits seedlings for sale: we have the following fruit seedlings for sale to farmers: 3000 yellow passion seedlings, 2000 avocados (Hass variety), 2000 grape tree seedlings. Call 0720 720 242 email: greenplants091@gmail.com

Compost for sale: Call Japhet Gachwe 0721 872 274, Meru.

Advice to farmers

We have been receiving many calls and enquiries on items advertised in this column. We would like to bring to the attention of buyers and sellers of various items advertised that **they should contact the advertisers directly through telephone, emails and facebook accounts given and not The Organic Farmer magazine.** We would also like to advise farmers to be careful not to send money before they have verified the quality of any items they intend to buy. The magazine will not accept any responsibility for any loss as a result of any transaction between the buyers and sellers of items advertised in the magazine. The symbol ■ denotes the facebook address of the contact advertiser - it is not possible to access facebook unless you have an account.