

The Organic Farmer

The magazine for sustainable agriculture in East Africa



Nr. 90 November, 2012

Shortage of good heifers

Kenya's dairy sector is growing. Payment to farmers for milk delivered to the processors is now more of less reliable, though the price of milk at the farm gate remains low compared to retail prices. Dairy farming is now more attractive than ever before with new younger farmers venturing into the enterprise. The demand for quality heifers is at an all time high with prices for pedigree ones going for as high as Ksh 300,000, which is way beyond the reach of small-scale farmers. Still, there are unscrupulous individuals who cheat



farmers by selling poor quality animals to them at inflated prices. As such, it is advisable that farmers breed their own heifers through selective breeding. Apart from milk production such heifers can also be sold to other farmers at very good prices. See page 2 & 3

Crops for the short rainy season

Farmers can still take advantage of current rains to grow crops that take a short time to mature.

The Organic Farmer

The weather forecaster predicts that most parts of the country will have more rains that may extend to December and beyond.

Some parts of the country did not get adequate rains between April and September. Farmers in such regions can take advantage of the short rain season to grow drought resistant crops. Below are some of the most suitable crops that farmers can try to grow during this period:

Herbicide resistance

TOF-Thousands of American farmers' harvest is threatened by superweeds. The farmers have used the same herbicide to protect genetically modified crops such as cotton, soybeans and maize. Now the weeds are herbicide-resistant, grow higher than the crops and cover them. The reaction of the farmers: According to a study of the Washington State University, published two weeks ago, the farmers are using higher concentrations of herbicides in an effort to control the weeds. Page 5



Sorghum: Sorghum is drought resistant and adaptable to most climatic zones and soils across the country. Sorghum can grow well with as little as 250 mm of rainfall. Local indigenous varieties are less prone to bird damage. Farmers can buy seed varieties suitable for their regions. They can get advice from Agricultural Research Stations or extension workers near their regions.

Cassava: Cassava can withstand drought and often grows well even in areas with poor soils. It can provide food to families when all other crops fail. However cassava production has been affected by the outbreak of Cassava Mosaic Disease (CMD). Farmers can buy Migyera variety, which is CMD resistant from KARI research stations near them.

Pigeon peas: Pigeon peas is drought resistant and grows well in dry areas with as little as 650 mm of rainfall. New varieties which mature in four months have been developed. Some farmers in Eastern Kenya majority in Ukambani region have adopted pigeon peas production and abandoned maize.

Maize: Farmers can grow early maturing varieties of maize during the short rains. One of the most popular varieties is the Katumani composite variety, which takes 3 to 4 months to mature. Other varieties that do well with reduced rainfall are H511, H12, DH01, DH02, DH03, DH04, DH09 DH10 and PH4 (for coastal areas). Farmers are advised to plant these varieties in pits, which collect water that can sustain the crops to maturity after the rains stop.

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Dear farmers,

One of the most important qualities of an organised small-scale farmer is good planning. Without an efficient set up, there is no enterprise that can succeed, as we have advised many times before. It is very crucial that farmers reflect and plan what they intend to do every season, so that they can avoid incurring losses that result from poor planning or lack of it. Small-scale farmers cannot risk failure, because this comes with dire consequences that take them a long time to recover or correct.

In Kenya, and elsewhere in Africa, small-scale farmers have to work with very limited resources in terms of start up capital, land and other assets. This means that they have to be very careful in the way they utilise the few resources available in their farms in order to maximize livestock and crop production. It is only farmers who plan ahead that are able to produce enough food.

In this issue, we have featured two important topics on livestock production. In the first article, we demonstrate to the farmers the benefits of cross-breeding while in the second one, we show them the benefits of fodder conservation in order to provide their dairy cows with adequate fodder during the dry season, which is about to start in the next two months. These two tasks: cross breeding and fodder conservation, are very important to dairy farmers.

The semen you choose when serving your cow determines the quality of the dairy cows you will have in future. When you serve a low milk-yielding cow with semen from a bull that sires (known to produce) high milk yielding calves, your future dairy cows will have a high milk production trait that will improve your income.

Concerning fodder, many farmers are caught unprepared when the dry season comes. They cannot get enough fodder to feed their animals, which reduces milk production. An organised farmer knows how much each of their dairy cows requires in a day. They then plan how much fodder the animals will require from January to April. If they feed them well, they earn even more because the price of milk goes up during the dry season. That is what we mean when we talk of good planning.

Cross-breeding improves cows productivity

Through selective breeding, farmers can introduce qualities such as more milk production and growth rate.

The Organic Farmer

The most common practice in the Kenyan dairy farming in the country is to go for dairy cows that produce more milk. The most common breeds in this category are the either Friesians, Ayrshire, Guernsey or Jerseys. Indigenous breeds such as the zebu or Boran, that are reared mainly in the arid and semi-arid areas, produce less milk. The dream of almost every farmer is to increase milk and meat production and income. They can achieve this objective through crossbreeding.

Benefits of cross-breeding

Cross-breeding is the process of combining two or more different breeds of animals in order to acquire the desired characteristics of each. This is done because no one breed of cattle has all the characteristics that a farmer requires. By careful cross breeding, a farmer can add the qualities that are lacking in



A well kept Fleckvieh-Friesian calf

their dairy cows. Some of the qualities that farmers wish to introduce in their dairy herds include increased milk production, fertility and quality of repro-

duction, calf survival (hardier calves), ease of calving, (lack of difficult births), improved growth rate of young animals, efficiency and longevity.

Studies on Fleckvieh-Holstein/Jersey crosses

Breeding societies the world over, are opposed to crossbreeding as it means a loss of registered animals from their particular breeds and hence a loss of income derived from selling genetics (semen) from those breeds. However, farmers have taken advantage of crossbreeding in order to introduce some positive traits that are missing in their animals to improve their productivity.

One of the most successful cross breeding programme that is being researched on by leading scientists at the Western Cape Department of Agriculture (South Africa). The research involves crossbreeding of the Fleckvieh and Holstein-Friesians and Jerseys. The study at Elsenburg Research Farm is aimed at comparing the performance of crossbred dairy cows (Fleckvie x Holstein-Friesian and Fleckvie x Jersey dairy cows).

Improved butter fat content

The study compares the milk yields of pure Holstein Friesians and Fleckvieh x Holstein-Friesian crosses. The data recorded at first lactation showed that the pure Holstein-Friesians produced

6519 kg of milk while Fleckvieh/ Holstein Friesian cross produce 6 109 kg of milk in the first year. Though the Fleckvieh/Holstein Friesian cross had a slightly lower milk yield, their milk had a higher fat and butter content. Using the standard milk pricing formula, the milk price for Fleckvieh/Holstein Friesian crossbred dairy cows was higher than that of pure Holstein-Friesian dairy cows.

Increased birth weight

According to the research, the lactation curve or the milk production levels for both the pure Holstein dairy cows and the Fleckvieh/Holstein crosses are almost equal. Ease of calving (no difficult calving) and birth weight was also recorded; the average birth weight of pure Holstein calves was 38.8 kg while that of Fleckvieh/Holstein calves was 39.2 kg. The average ease of calving was 1.3 for Holstein and 1.0 for the crossbred calves, where 1.0 indicates no problem at calving. When comparing Fleckvieh x Jersey calves to pure Jersey calves, the crossbred calves had an average birth weight of 31.9 kg compared to 25.1 for

Jersey calves.

The reproductive performance of Fleckvieh crossbred cows was better than that of pure-bred Holsteins and Jersey ones. Compared to pure Holsteins, Fleckvieh/Holstein crosses required fewer inseminations per conception (1.93 for Fleckvieh/ Holsteins against 2.79 for pure Holsteins). Fleckvieh/Holstein crosses also had shorter calving intervals from calving to first insemination (89 days) than Pure Holsteins (97 days) and from calving to conception (132 days for Fleckvieh/Holsteins and 172 days for pure Holsteins). Similar trends were observed for Fleckvieh/Jersey crosses compared to pure Jersey cows.

Better milk quality

A paper presented at the 2010 Conference of the South African Society for Agricultural Extension, demonstrated the benefits of cross-bred dairy cows in reducing the impact of livestock on global warming. It was found that any large scale reduction in livestock number would compromise food secu-

Continued on page 6

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. The Organic Farmer is published monthly by icipe and distributed free of charge to farmers.



icipe

The reports in the The Organic Farmer do not

necessarily reflect the views of icipe.

The Organic Farmer is sponsored by BioVision, a Swiss-based foundation for the promotion of sustainable development. www.biovision.ch

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Healthy heifer today, a good cow tomorrow

Proper feeding and continuous monitoring are very important in the growth of healthy heifers.

The Organic Farmer

Heifers are easy to manage since their nutritional requirements are low compared to adult cows (the feed mainly helps them to grow and maintain their bodies). Feeding them with concentrates at the rate of 1 per cent of their body weight is advisable. If the farmer is feeding them legumes (such as sweet potato vines lucerne, desmodium luecaena, sesbania or gliricidia), then they would require concentrates with 14- 16 per cent crude protein. If the farmer has put the heifers on grass forage, then they would require supplementation with concentrates having 15-16 per cent crude protein.

Protein is extremely important in the diet of growing heifers to ensure they develop adequate frame size, height and growth. If the heifer feed ration is not balanced, then they become stunted.

Feeding determines future milk production

Farmers should observe the following to maintain healthy heifers:

- Heifers cannot mature fast enough if they are poorly fed. Poorly fed calves will delay in first calving and also show reduced milk yield.
- Feeding heifers with too much energy foods leads to fat accumulating around the mammary glands, this hinders the development of secretory tissue and reduced milk production.
- Poorly fed heifers show stunted growth, their small bodies make it very difficult to calf (a condition called dystocia). Overfed heifers also have a narrow pelvic opening and will have difficulties calving down.
- The size of the heifer determines the amount of milk it will produce. If for example, a farmer has two twin heifers, the larger one tends to produce more milk than the smaller one.
- Feed high on energy but low on protein results in calves that are short (stunted) and fat. On the other hand, high protein and low energy feed results in tall, thin heifers.

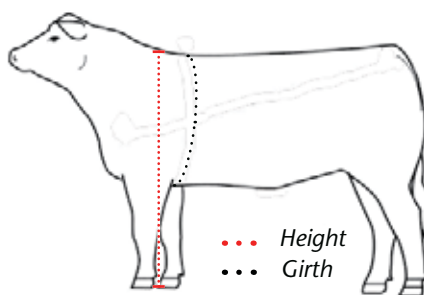
Underfeeding heifers affects their fertility

If your heifer is underfed and slow growing, it may reach puberty (matu-



riety) and ovulate, but it may not show any signs of heat (silent heat), making it difficult for such heifers to be served. Heifers that are well-fed will show signs of heat and have a higher conception rates. Overfed heifers become fat and are unable to conceive compared to heifers of normal size and weight.

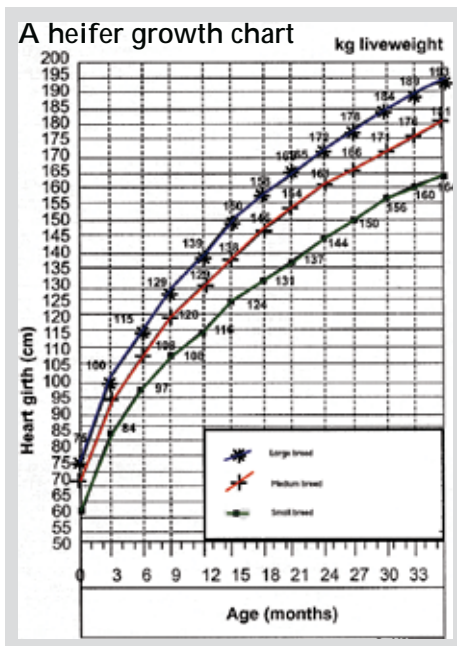
To monitor the performance of heifers, it is important for the farmer to measure their body weight using a tailor's tape measure around the chest just behind the front legs (heart girth). To measure the height, use a calibrated measuring



stick. The stick should be placed at the highest point or tip of the front legs (also called the withers).

Measure heifer weight and height

The readings are then plotted on a growth chart (shown right). Different



cattle breeds have different growth curves since there are large breeds (e.g. Friesians) medium breeds (Guernsey) or small breeds (Jerseys). The growth of a heifer should be such that any increase in weight should be accompanied by a proportionate change in height.

For a heifer (Friesian) that is about to be served (about one and a half years or 280 kg body weight) farmers can give grass forage as recommended above and add about 18 to 20 kg of legumes (calliandra, desmodium, purple vetch, luecaena etc) daily. This will provide enough crude protein for growth.

Steaming up in-calf heifers

When your in-calf is about to calf down (usually in the last 4 weeks), it requires some extra concentrate feed. This feeding, which is called "steaming up" provides extra nutrients for the heifer and the growing unborn calf (foetus). The feeding is also intended to allow her stomach (rumen) bacteria to get used to high levels of concentrates. It also allows the heifer to put on extra weight (reserve energy) to promote maximum milk production from the beginning of the milking period.

Important feed recommendations

- Prepare heifer feed depending on nutrient analysis of the silage, hay or other forages.
- Include feed supplements in heifer feed rations.
- Feed heifers with high quality grazed forage when it is available.
- Supplement grazing heifers diets with silage, hay, grain or cotton seed cake-based TMR when needed.
- Deworm the heifer at least twice per year at the beginning and at the end of the rainy season.
- Always monitor the average daily gains in weight and height to make sure your heifer is growing properly and according to the feeding programme.

Heifer feed rations

Minimum daily nutrient requirement of a Holstein-Friesian heifer for 0.3 kg daily weight gain.

Body weight (kg)	Dry matter intake (kg)	Crude protein (kg)	Net energy mcal/(kg)
100	3.3	18.20	0.36
200	5.4	18.20	0.49
250	6.5	7.12	0.34
400	10.0	6.10	0.32
500	12.8	6.10	0.31
600	16.2	6.10	0.29

Watch out! The dry season is coming

With good planning, farmers can conserve enough fodder to see them through the dry season.

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Clever farmers do proper planning. They conserve quality forage harvested in the wet season for use during the dry season. This will help them avoid a reduction in milk yield and provide enough feed to their animals. Looking for fodder when the dry season has already started is often too late.

Since roughage forms the basis and the bulk of animal feed, it is good to know the benefits animals get from it: Their protein and energy requirements.

Protein sources: This can be obtained from sweet potato vines, lucerne, purple vetch, lupins, desmodium, fodder trees i.e. sesbania sesban or calliandra;

Energy sources: Napier grass, fresh and silage, maize stalks, whole maize crop chopped, fed while green, or made into silage or hay, straws, weeds and banana pseudo-stems.

The most common methods used to provide quality feed throughout the year include hay and silage making. Both of these require investment in time and labour, but they eventually pay. Farmers who can feed their animals well during the dry season derive a double benefit from the practice; they keep their animals healthy, and secondly, they get higher income since the prices of milk usually goes up at this time due to short supply.

Hay, cheap and valuable

Hay making is the cheapest way to make dry season fodder. You can use all kinds of grasses except Napier, and you can enrich the hay's quality by adding forage legumes such as desmodium, lablab, Lucerne etc.

Harvesting: The stage at which a crop is cut is important. Grasses should be cut just before flowering. Forage legumes also need cutting before flowering or at intervals of 6-8 weeks. Grass cut before full flowering has a feed value of 9 – 12 percent crude protein, after flowering this reduces to between 6 and 8 percent.

Drying: Most materials take 2 to 3 days to dry in the sunshine, forage legumes take 4 to 6 hours. Turn over the material frequently to ensure proper drying. Over-drying gives poor quality hay; likewise, if you have too much moisture in the hay, it will form mould and start rotting when stored.

Storage: Even the best hay will get spoiled if wrongly stored. If you store it as bales or in the store, it should be kept away from direct sunlight and rainfall. In the field, hay should be stored on a raised platform to avoid damage by rodents and termites. It should then be covered with grass or with plastic.

Feeding: A dairy cow weighing 400 kg



Improve the value of maize stalks

Maize stalks are available in plenty after harvest. Store them properly under dry and shaded conditions. Avoid direct grazing as the animals trample on the residue, spoiling it through urine and droppings. In general, maize stalks are low in digestible energy and protein. Dry cows can probably maintain their body condition on crop residues like this with a little protein and some mineral supplement. Milking cows need a substantial amount of supplementation to provide enough energy and protein.

Add value to maize stalks

- Chopping increases acceptability of residues.

- Sprinkling them with mineral salt is useful and increases intake.
- Soaking in diluted molasses overnight increases intake and provides energy.
- Add leguminous fodders (see box on the next page). They are rich in minerals and proteins and increase digestibility of crop residues. They should be supplemented at a rate of not more than 30% of the ration. This corresponds to 10 to 15 kg of fresh leaves (or 3 to 5 kg of dried leaves) per day per cow.
- Concentrates like dairy meal or seed cakes improve protein and energy content of the ration and support milk production.

will consume an equivalent of about 3% of its body weight in dry matter (12 kg dry matter) per day. Since hay contains 85% dry matter, if the cow does not eat

anything else, it will require 14 kg of hay per day. Milk production can be improved by adding fresh roughage (e.g. Napier), and concentrates.

Silage is high value fodder

Silage making is the technique of preservation of green material by fermentation. Common materials for making silage include Napier grass, maize, sorghum and sugarcane tops. Forages should be wilted in the field for half a day before using it for silage making. - It is recommended that the silage bags be filled at the point of storage, since they are very heavy and not easily to move when packed with silage.

grass that has low sugar content. Maize bran or cassava flour can be added to improve the carbohydrate (energy) content, leaves of fodder trees as a source of protein.



Chop the wilted material, sprinkle it with a molasses/water mixture (for every sack use 1 litre of molasses mixed with 2-3 litres of water). This is important especially for material like Napier



Fill the chopped material into the plastic tubing (1000 gauge), compact it well, then tie the other end to seal. Fermentation is usually complete after 21 days. A grade cow may eat upto 40 kg of silage per day. Supplement lactating cows with dairy meal at the rate of 1 kg of dairy meal for every extra 1.5 kg of milk produced above 8 litres. To avoid bad flavours in milk, feed silage after morning milking and at least 3 hours before afternoon milking.

Source: Feeding dairy cattle in East Africa by East Africa Dairy Development Project

Good and cheap fodder sources

Fodder trees are a cheap source of protein for dairy cows. They provide protein-rich fodder throughout the year. Farmers could save money if they would plant fodder trees and leguminous plants such as purple vetch, desmodium, lucerne. Fodder trees improve soil fertility by providing green mulch or by fixing nitrogen.

Calliandra does well in upland areas with medium to high rainfall (700–2000 mm).

Leucaena also does well in upland areas with medium to high rainfall. It is slightly more drought resistant but is more subject to attack by insect pests. Regrows well after cutting and harvesting.

Sesbania grows better in high-rainfall areas and does better than other fodder trees in higher, cooler areas. In its early stages, it grows faster than calliandra or leucaena but it does not grow again after harvesting.

Use of fodder trees

- Leaves, pods and soft young twigs provide good feed for cows.
- They are a good supplement to straw, maize stalks and poor grass diets.
- They provide high-quality forage in the dry season.

Feeding

Leaves and young twigs can either be fed fresh cut or dried for later feeding. To encourage intake, mix with mineral salts or other feeds.

Leaf meal

Leaf meal is conserved material from the protein-rich fodder legumes, which include lucerne, calliandra, leucaena and dolichos. Harvest the leaves and dry them on a clean floor (under shade). Store it in a dry place and away from the sun. Feed as a supplement. The meal should not form more than 30% of a daily ration. Wet the leaf meal with water before feeding to reduce wastage through spillage.

Leguminous plants

Lucerne, purple vetch, desmodium etc. belong to the legume family. By fixing nitrogen from the air, they improve the quality of the soil and are as well good fodder for livestock, either green or as dried leaf meal.

Purple vetch is palatable for grazing and for hay/silage making. Hay samples show very high animal feeding value: Crude protein (16-28%), digestible (50-82%) and metabolise energy.

Lucerne (Alfalfa) contains a lot of micro-nutrients, lasting protein, digestible fibre and energy to provide nutritious fodder.

Desmodium has high protein content and can be used as hay or for silage and, in dried form also leaf meal.



Herbicide resistant weeds choke crops

Overuse of Roundup® herbicide has led to emergency of super weeds in US farms, which are resistant to all herbicides in the market.

TOF - Weed resistance has spread to more than 12 million acres in key agricultural areas in the Southeast, and the maize and soybean growing areas of the Midwest of the USA. Many of the worst weeds, some of which grow more than six feet tall and can sharply reduce crop yields, have become resistant to the popular weed-killer Roundup® as well as other common herbicides. Moreover, superweeds are cross-pollinating the weeds around them with the resistant gene, and this is spreading mutant weeds further and faster than ever imagined.

It all started 20 years ago when American farmers began to buy Agromulti Monsanto seeds. These seeds are genetically engineered to resist the harsh toxins of herbicides, especially Roundup®, Monsanto's best-selling product. That means, even if the land is sprayed with huge amounts of chemically-laden herbicides, the weeds are not affected and will grow. In the U.S., 94 percent of soybeans and over 70 percent of corn and cotton now have the Roundup®-resistant gene.

Indeed, Roundup® worked well for many years; farmers were celebrating, since they could stop the growth of destructive weeds with less labour and savings involved. This makes spraying with industrial sprayers or with planes more efficient. They planted the Roundup Ready® seeds of America's biggest cash crops including corn, soy, cotton, alfalfa, sugar beets, etc. The users of Monsanto's product did not hear the warnings of doctors and people from communities around the world, who started voicing concerns over the dangerous mutant food, the birth defects and rising cancer rates in places where herbicides were frequently used.

Weeds resist chemicals

But now the super weeds have developed a resistance to Roundup® and other herbicides, and farmers are scrambling to find out the best way to combat

them. Years of spraying plants and crops with a single herbicide led to an adaptation of the plant-life ecosystem and the growth of super weeds, now killing the crops. Super weeds are not exactly a new phenomenon. For several years, concerned farmers have been reporting cases of herbicide resistant weeds from all over the world, including Argentina, Chile, Brazil, Europe, South Africa and Australia.

Stronger chemicals as solution?

In a meeting in the US capital Washington with representatives of the Agromultis, the U.S. Department of Agriculture and of farmers, some farmers admitted that they have been relying on the chemicals for too long. But farmers in need of a change to a more natural method in agricultural production were in the minority. Most of them demanded stronger herbicides; It is not only Monsanto that is working on such products. The Dow Chemical company is seeking regulatory approval of a newly formulated herbicide built on traditional 2,4-D chemical herbicide; it was used during the US American war in Vietnam and caused deformities in thousands of new born children in the region.

Danger to the environment

TOF - In the context with the superweed threat, farmers in the U.S. discuss the resistance of pests to pesticides. Genetically modified Bt (*Bacillus thuringiensis*), a Monsanto-made pesticide, has created a number of new mutated insect species, or superinsects. The Western rootworm beetle, one of the most serious threats to corn, has developed resistance to Monsanto's Bt pesticide.

At first, pesticides appear to get the job done. But some of them survive; the offspring of the survivors carry the genetic makeup of their parents. More and more of them inherit the ability to survive the exposure to the insecticide; repeated application and higher rates of the insecticides does not kill the insects anymore.

We do not need to look to the U.S. Already farmers in Kenya are using dangerous pesticides such as Furadan or Triatix against thrips and white flies, on their vegetables.

A farmer helps fight poverty

The success of Wawire, in Kimilili, demonstrates how income generating activities can free farmers from poverty.

Simon Degelo

Patrick Wawire used to be like any other farmer in Kenya: Producing just enough to feed his family and struggling to pay his childrens' school fees. This was until early 2011 when he learnt about the *i-TOF* centre and its farmers' training programme in Western Kenya. Soon, he realized that this was what he needed to improve his situation and that of other farmers. Together, they formed a farmers' group and named it Agricultural Development Improved Centre (ADIC). The local *i-TOF* worker Alfred Amusibwa started training them in organic farming. Patrick did not only adopt sustainable agriculture, but also started a range of new income generating activities.

Made own beehives

He wanted to do beekeeping, but did not have enough capital to purchase modern ones. This situation prompted him to make his own beehives using locally available material. Advised and encouraged by Amusibwa, he tried out a *jua kali* (informal) design and constructed simple wooden boxes, which he covered with a black polyethylene sheet at the top. Within a short period, each of the boxes was occupied by a colony. At the end of the season he harvested more than 80 kg of honey, which he sold at a good price in Nairobi. He ploughed back the profits into more investments.

Farmer-entrepreneur

He also tried a range of other activities, such as the keeping of geese, chickens and rabbits. The most successful of his projects was aquaculture. After an *i-TOF* training on fish farming and management, Wawire, together with other farmers, renovated fishponds which they had earlier abandoned. Now Wawire can harvest as many as 10,000 pieces of tilapia every season per pond. He reinvested his earnings by building more ponds and today owns 15 of them,



Wawire with Moringa seeds for sale

up from the two he initially had. That's how Wawire turned from a small-scale farmer into a successful entrepreneur, within only one year.

Helping the community

Most people in his situation would have squandered their earnings on luxury items. Not so for Wawire. He invested most of his profit in helping his community. He has set up a kindergarten, paying teachers to hold classes in the local church during the week. And currently a small communal dispensary is under construction, also thanks to his funding.

Asked what motivated him to help the community, he explains that he enjoys engaging in community work. "I want to free this community from poverty and my fellow farmers to be role models to others," he says. And already several of them have improved and expanded from aquaculture into bee or poultry keeping. Through their merry-go-rounds savings and lending scheme, they have been able to raise enough money to buy sheep for every member.

"And now we plan to start savings to buy dairy goats and cows for our members, for us poverty will be a thing of the past," says one of the members with confidence.

Answers in brief

Organic weed control

Is there any organic input that can be used to control weeds?

There are various methods that can be used to control weeds. One of them is the use of cover crops eg purple vetch, sweet potato vines, desmodium, mustard etc. The other very cheap method is the use of mulch. After harvest, crop residue can be left to dry and later spread to cover the ground surface; no weeds can grow when the ground is covered. Like other plants weeds require sunlight to make their food through photosynthesis; if you deny them sunlight, the weeds will turn yellow and die.

Plant extracts application

How many times should I apply plant extracts to my crops?

Plant extracts do not the same way as chemicals. A farmer has to apply plant extracts several times say, two to three times in a week. Continuous application provides the crop with adequate protection that ensures the crop is not attacked by any pests. Since most plants extracts are mixed with plants such as tithonia, your crop will also benefit from added nutrients which boosts their healthy growth.

Vaccinating chickens

Which organic vaccine can we use to control chicken diseases?

The use of conventionally prepared vaccines is allowed in organic farming due to the danger posed by diseases such as New castle, Coccidiosis etc. However to boost the immunity of chickens, it is advisable to put aloe vera extract frequently in their drinking water. You can also add EM1 to control diseases and digestion in chickens.

Egg storage

How can we arrange eggs in a tray?

The broad part of an egg should face upwards because it's where the air sack is for the egg to breath.

>>> from page 2: Breeding

ity, hence the need for more productive dairy cows. Dual-purpose breeds have been identified as one way of overcoming environmental effects of dairy and beef cattle.

Another research project is also investigating the milk fatty acid composition or the Conjugated Linoleic Acid (CLA) of Fleckvieh/Holstein and Fleckvieh/Jersey crosses. Since CLA has been found to have anti-carcinogenic and anti-diabetic benefits for human beings, milk with higher levels of these fatty acids could be sold under a brand name as a health supplement, thus fetching better prices for farmers and a benefit to consumers. (Source: *Farmers Weekly* June 17 2011)

i-TOF Centre

In August 2009, *The Organic Farmer* magazine opened the information and input centers (*i-TOF*). If a farmers' group is interested in training, they should get in contact with our *i-TOF* Centres directly. The following are the regions where they are located, including their contact addresses:

i-TOF Centre Western Province

Location: Majengo,
Extensionist: Alfred Amusibwa,
Contact: 0724 331 456 New: 0738 254 260

Email: itof7@organickenya.org

i-TOF Central Province

Location: Gatuto/ Kagio
Extensionist: Peter Murage
Contact: 0724 331 375 New: 073
Email: itof2@organickenya.org

i-TOF Eastern Province

Location: Kangundo town
Extensionist: Victoria Mutinda
Contact: 0724 331 405 New: 0738 254 262
Email: itof1@organickenya.org

Used properly, pyrethrum is effective

Pyrethrum is a cheap and environmentally friendly biopesticide that can be used to control a range of pests.

The Organic Farmer

"I am fed-up with buying chemical and biological pesticides, I have planted pyrethrum on a small piece of my land for use on my farm. What do I need to prepare a plant extract to protect my crops?"

This is a good idea from a farmer. Pyrethrum has been used for centuries as a pesticide to control many common pests. Pyrethrum powder and plant extracts can be used to control the following pests: African armyworm, African bollworm, aphids, cutworms, spider mites, thrips, whiteflies, maize stalk borers and potato jassids.

Tips for using pyrethrum

Before we give you a recipe for preparation of a pyrethrum plant extract, we would like to emphasize some standard procedures and application methods for use of pyrethrum plant extracts:

1. Pick the flowers on a warm day when they are fully open and dry then in a shady area. Make sure that flowers are free from moulds.
2. When properly dried, store the flowers in a well-ventilated container, (never use plastic container), away from direct sunlight and moisture. Light breaks down the active ingredients in the flowers, reducing their effectiveness.
3. Do not store pyrethrum for a long period. A six-month-old dried flower may only have half the amount of active ingredients compared to a freshly dried one.
4. For preparation of the extract, do not use kitchen utensils. Afterwards, clean all the containers properly.
5. Avoid direct contact with the raw pyrethrum extract while in the process of the preparation and during the application.
6. Place the plant extract out of reach



of children. Leave it to stay overnight before use.

7. Harvest all the mature and ripe fruits of the crops to be sprayed before treating with pyrethrum.
8. Always test the plant extract formulation on a few infested plants first before going into large-scale spraying.
9. When adding soap as an emulsifier or spreader, use a potash-based one. Liquid dish soap is easier to use.
10. Wear protective clothing while applying the extract.
11. Wash your hands after handling the plant extract.
12. Do not harvest your crop for one day after pyrethrum application. Pyrethrum and pyrethrins have a one-day Post Harvest Interval (PHI), as the active ingredients break down quickly when exposed to sunlight.

Precautions:

- Pyrethrin and pyrethrum insecticides are mildly poisonous. Prolonged contact with the skin can produce a rash, and inhaling dust or spray can cause headaches and sickness. Some people have allergic reactions to it.
- Pyrethrins and related products tend

Recipes for Pyrethrum in pest control

Pyrethrum powder

Grind flowers to a dust. Use it pure or mix with a powder like talc, lime or diatomite. Sprinkle over infested plants. Py-mack can be used in a similar manner.

Pyrethrum spray

1. Mix 20 g of pyrethrum powder with 10 litres of water. Soap can be added to make the substance more effective. Strain and apply immediately as a spray. For best results this should be applied in the evening.
2. The active ingredients can also be extracted by alcohol. Mix one cup powdered pyrethrum flowers with 1/8 cup of isopropyl alcohol (the blue alcohol used in house cleaning) or kerosene. Cover the container and let it sit overnight. Strain through a clean cotton cloth, then store the extract in a tightly sealed and labeled container. When you need to use it, add three litres of water to the extract and spray.
3. Preparation for large-scale spraying: about 1 to 1.5 kg-dried pyrethrum is mixed with 100 litres of water and 3 litres of liquid dish soap. Strain and spray. The addition of soap can increase its efficacy for up to 4 times.

Source: *infont-biovision*

to work best at lower temperatures and cloudy conditions. The efficiency is reduced when sprayed at midday on a hot day.

- Pyrethrin and pyrethrum insecticides will kill lady beetles, but do not appear to be harmful to bees.

- The insects can sometimes recover from the amounts required to produce a knock down effect within 24 hours (especially if the extract is made from slightly older flowers). Close observation is required to ensure complete eradication of the targeted pests. If the pests do not die, it means a higher concentration is needed.

How can I attract bees into my hives?

I have installed nine hives and only three have been colonized so far. A. J. Bore

Many beekeepers have this problem. But there are many reasons why bees fail to occupy hives. For a start, hive sanitation is very important when it comes to attracting bees. Ensure the hives are cleaned thoroughly before trying again. You can also smear propolis especially at the hive entrance. Also make sure the entrance faces the direction from which the bees are coming.

A plant by the name *occimum suave* (*Muthaa* in *Kikamba*) is also a good bee attractant (I do not know any other local name for it but I will find out).



Check also for any signs of ants on the new hives because such pests can discourage bees from occupying a hive.

Another step you can take is to change the catchment area.

Timing is also very important, the swarming season is between June and July- hang the hives high enough for the swarming bees to see them; hives can be placed to a height of even up to 10 metres. It is important to know the migratory route of the bees in order to place the hives along such a route.

A company (Manlake Ltd) sells commercial attractants but we are not sure if they have a local representative. We will find out and let you know later. In case any of these methods work for you and please let us know.

The benefits of intercropping

If you mix the right plants together they can benefit each other during their growth.

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Companion planting is growing together vegetables that are "friends"; such plants benefit from each other because of their different characteristics. In good combination, different vegetable plants produce different chemicals, enrich the soil with nutrients and organic matter, in this way supporting each other.

Pairings of plants which grow well together:

Vegetable	Friends	Enemies
Beans	Potatoes, carrot, cucumber, cabbage	Onion, garlic
Carrot	Peas, leaf lettuce, onion, leek	Sesame
Celery	Leek, tomato, bush beans	
Cucumber	Beans, corn peas	Potato
Lettuce	Carrots, radish strawberry	
Onion & garlic	Beet, tomato, lettuce	Beans, peas
Parsley	Tomato	
Peas	Carrot, turnip, cucumber	Onion, garlic
Potato	Beans, corn, cabbage	pumpkin, cucumber, sunflower
Soybean	Compatible with all crops	
Strawberry	Beans, spinach	Cabbage
Tomato	Onion, parsley marigold, carrot	Potato, fennel, cabbage

Another benefit: Certain plants protect other plants from pests or diseases because the pest is repelled by the aroma of the companion plant; for example onions planted either side of a row of carrots help to deter carrot flies. Probably the best-known companion plants that every farmer in Africa knows is the combination of maize and beans. In the push-pull method, desmodium is planted between maize and beans and repels the stemborer, the stemborer does not like the smell of desmodium, so it is forced to move away, saving the maize.

Incubators: We sell electric incubators, with a capacity of 60 eggs. The incubators consume less power (about 115w). One unit goes for Ksh 14,000. Contact Faith 0721 395 149, 0788 511 800.

Water melon production: We install drip irrigation systems for water-melon production. Please contact me at wanyoz@gmail.com. +254725812827.

Incubators and chickens for sale: We are selling home-made cardboard box chicken incubators, heavy breeder chicks (parents over 3 kgs in weight), fertilised Kenbrid and Kenbro eggs, white guinea fowls and Kuchi cocks. Soon we will have our own home-bred chickens. Contact Eden Poultry Farm, Mombasa. Tel: 0723229636 or Email: edenpoultryfarm@gmail.com.

Kenbro eggs: I am selling fertile Kenbro eggs at Ksh 20 per egg. Anyone interested in Kenbro eggs. Please contact Lucas Wahinya on 0721 344 852.

Fertilised eggs: Any person interested in fertilized Kenbro eggs can call Potas Abungu 0725 545 311, Nyanza

Training: Do you want information on Kenbro husbandry and construction? Do you want fertilized eggs with a hatch rate of 80-90%. Contact me on 0722 354 619, 0770 298 1330.

Kenbro eggs: I am selling fertile Kenbro eggs for a hatchery in Kapsabet & Kakamega at Ksh 25 per egg. Contact Dan on 0721 334 681.

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iAfya's Mama Fatuma explains... **The signs of Pregnancy!**



Not having your period and feeling sick mostly in the morning is a typical sign of pregnancy.



Some changes in the body are noticed. The breasts gets bigger and the belly grows.



You can learn to monitor the growth of your belly. At 4 months it is usually at the level of the navel.



It is also a normal sign of pregnancy - to pass urine often during the day.



Some women have dark areas on the face and breast - the "mask of pregnancy". A normal sign based on the hormonal changes during pregnancy.

Look out for the next topic on: **Staying healthy in pregnancy!**

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