

The Organic Farmer

The newspaper for sustainable agriculture in Kenya

Nr. 6 Sept./Oct. 2005



Dairy goats are becoming popular with many farmers, page 4,5

Fighting the potato disease

New approaches are being used to control bacterial wilt and to increase production of clean potato seed.

The Organic Farmer

In the May and June issues of *The Organic Farmer*, we gave you tips on how to control the devastating potato bacterial wilt. Following the story, many farmers have written to us requesting for copies of the two

issues. But all the copies were sent out to farmers. That's why we decided to give farmers once again the most important tips they can apply to control the disease. (See page 12).

Apart from the disease we mentioned that the country faces an acute shortage of clean potato seed for sale to farmers.

Positive selection

To address this problem, the government with assistance from the International Potato Centre (CIP) and the German Technical Cooperation (GTZ) is using two approaches. One of these is to use selected farmers across the country to produce clean seed for sale to other potato growers. The other is to train the potato farmers on positive selection of healthy potatoes in their farms, which they are encouraged to use as seed the following season. The method has been found to increase the overall yield by about 50 per cent. The two approaches could greatly reduce the spread of the disease while increasing potato yield for farmers.

Dear farmers,

As you can see we have additional pages in this issue of our newspaper. We have made a double issue for September and October. We are taking a break for one month in order to reflect on what we have already done. This period will give us a good opportunity to go out and meet as many farmers as possible and hear their views. It will enable us provide better service to you. We also will use this break to streamline the distribution of the paper and ensure it reaches farmers in every corner of the country. The aim is to empower them with the relevant information on agriculture and organic crop and animal production in particular.

*We are so disappointed that some of the people we have entrusted with the responsibility of passing on the copies of *The Organic Farmer* to fellow farmers have not done so. Instead we have at times found the copies stacked in an office. This is sad taking into consideration the number of farmers who are calling us daily, requesting for copies of the newspaper. One cannot understand why these people would not like farmers to benefit from this useful information. Are they not happy when farmers are enlightened? Farmers, if you have not received a copy, approach the chairman of your group and ask him why your copy for the month is missing!*

Going by the response we are getting daily from the farmers, demand for the newspaper is higher than we are able to meet. We will have achieved our objectives in information dissemination if every farmer who gets a copy of the paper is willing to share it with a neighbour, discuss the content, may it be an important tip on how to control a particular pest, where one could get seeds for a particular fodder crop or even how to prepare farm yard manure in the right way.

As we have mentioned many times, the responsibility of improving agricultural productivity in the country falls squarely on the farmers themselves. We will do our best to provide you with the relevant information to help you improve organic agricultural production.

The Editors



In this issue

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The saviour of cabbage

A wasp stops destruction of cabbage by Diamondback moth. [Page 8](#)

MY OPINION

By John Kariuki

Are we Kenyan farmers serious with farming? I doubt it! If you want to find out yourself, just walk to the small garden behind your house. Chances are that your bean or vegetable garden is overgrown with weeds. It sounds very good to blame the government and urge it to support agriculture. Or to blame the extension officers and the Non-governmental organisations staff for sitting only in their offices instead of visiting you. Do not rely on them, depend on yourself! It is up to us farmers to work hard. In this way you and your families will move forward.

John Kariuki is farmer in Nakuru

The Organic Farmer

Nr. 6, September/October 2005

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The powder that kills pests

Diatomite is an effective powder for pest control, it's deadly to insects and completely harmless to animals.

The Organic farmer

Diatomite is a powder made up of fossilized microscopic plants called diatoms. The plants once lived in the oceans and lakes, which covered much of the world in prehistoric times. Today they remain as deposits of soft porous white rock. In Kenya the African Diatomite Industries Company mines diatomite at Kariandusi near Gilgil and Soysambu.

This porous white rock is pounded to extremely fine powder, consisting of millions of small particles which have very sharp edges. If you would see diatomite under a microscope, its particles resemble broken glass. How does diatomite work against insects, and why is it deadly to them? This is easy to explain. Most insects have a waxy outer shell covering their bodies. When diatomite's sharp edges come into contact with an insect or a parasite, the protective coating is pierced, causing the insect to dehydrate and die. This makes diatomite an excellent and totally natural pest control, with no risk of chemical damage to animal tissue. By rubbing the dust into an animal's coat, it can be used as a control for fleas, lice and other external pests.

When used correctly, diatomite is effective against ants, aphids, bollworm, salt marsh caterpillar, cockroaches, maize worms, earwigs, houseflies, fruit flies, leaf perforators, leaf hoppers, lygus bugs, mites, pink boll weevils, red spider mites, slugs, snails, termites, Japanese beetle (grub stage) and many other insects.

Useful for stored maize

Australian and American farmers have for decades relied on diatomite to control pests in both cattle and plants. The very strict US health laws do not require products containing the substance to carry a warning, but one should avoid breathing in diatomite dust.

Diatomite, a naturally occurring siliceous sedimentary mineral compound, is relatively unknown in Africa. Not even in South Africa do the farmers know about Diatomite, even though the country boasts some top quality diatomaceous earth, all of which is mined in the Northern Cape. Diatomite can also be used as a natural preservative for protecting stored grains. You apply 3 kilos of the

substance to each ton of maize, barley, buckwheat, wheat, oats, rice, rye, sorghum or mixtures of these grains directly after harvesting. Coating the grain's outside surface can be done when the grain is being moved into storage.

Diatomite is ground and graded for various uses, which include filtration in beer industry. It is also used for the same purpose in sugar syrup making, water, fruit juices, swimming pools and lubricating oils among others. And you can find it in toothpastes and plastics.

Following strict rules on use of chemicals in agricultural produce exported to European Union markets



in the last few years, Kenyan companies growing flowers for export to this market are increasingly turning to diatomite for pest control. According to Rogers Oluchiri, the sales and marketing manager at Diatomite Industries, one of the major customers for diatomite is Home Grown-Kenya, a flower company based at Naivasha which is now using diatomite for pest control.

Even Su Kahumbu who is answering the farmer's questions in *The Organic Farmer* is using diatomite. She is applying it on her animals and vegetables. Diatomite can be mixed with water and sprinkled over the vegetables.

Available and cheap

In Kenya diatomite is on the market under the name KensilF. Phillip Sudi, of the quality control section of Diatomite Industries, says the KensilF grade of diatomite is specifically suited for agricultural application. A Kilogramme of KensilF goes for Ksh 20. For trade enquiries farmers interested in buying diatomite should get in touch with the company:

African Diatomite Industries Compay.
P.O. Box 32 Gilgil, Tel.050-4015209 or 050-4015209

"Sacco loan has improved our farm"

Co-operative societies are beneficial to farmers. In this issue we provide an example of the Mathira Co-operative Sacco.

By Eric Lumosi Asiligwa

Mzee Zacharia Kanyotu is a small scale farmer whose life has greatly improved thanks to loans he received from the Savings and Credit Co-operative Societies (Saccos). "If it was not for the loans we receive from the co-operative societies, we would not be able to send our children to school, developed our homes, pay for unforeseen urgent needs or improve our farms", he says.

Mzee Kanyotu is one of thousands farmers in rural Kenya who has seen the benefits of Saccos. For farmers in the rural areas, hard cash is normally difficult to come by except through ventures like these. Saccos are a concrete process of fighting against poverty by developing the hidden and non-productive financial resources of the rural populations. Saccos provide financial self-help to its members who eventually learn to tap their potential.

90'000 members

For over 30 years, Nyeri Farmers Sacco has served the farmers in Nyeri District making a big difference in farming. As a result, Karatina is recognised for its agricultural achievements. The society which started in 1974 as a union banking section of Nyeri District Co-operative Union was transformed to a cooperative society in 1998. "This was done specifically to mobilise savings for its members", said the operations bank manager Karatina branch, Mr. George Githinji. The other nine co-operative branches include: Nyeri, Mukurweini, Othaya, Ruringa, Mwingi, Naromoru, Nanyuki including



Karatina town which is the main branch.

The Nyeri Farmers Savings Society boasts of hosting over 90,000 members in all of its branches. A lot of water has passed under the bridge since its conception. Now it has a high capital base and a share value of over 50,000 members who pay Ksh 100 membership fee. "At the moment, the society is stable and has assets such as buildings and land which appreciate in value", Mr. Githinji said.

The Sacco serves coffee farmers, tea farmers, dairy farmers, businessmen and women, and other small co-operative societies. These include the Baricho Farmers Co-operative Society, Kiama Farmers Co-operative society, Mathira Farmers Co-operative Society among others. The co-operative societies specifically help in marketing

farmers' produce. In addition to the produce which guarantees a certain amount of money regarded as shares, farmers may also choose to increase their shares by depositing them in the bank.

Credits

All Sacco members are entitled to loans. These may be given out to pay for school fees, improve farms, and repay debts, capital to start a business or to buy assets. In the Mathira Sacco branch alone, the total loan given out for 2005 amounted to Ksh 5.1 million. "We have been having cases of defaults where farmers defect to other Co-operative Sacco groups without repaying our loans", complained Mr Githinji. He said this was a big hitch in the development of the bank. However, a debt collectors' group has been formed to follow up on those who default. Alternatively, those who guaranteed for the loans will be required to re-pay the loans themselves. According to Mr Wamau Wanjau, the Baricho Farmers Co-operative Society accountant, "the Co-operatives Law Act does not allow one to join two societies at the same time. This is a punishable offence with up to two years imprisonment or a fine of Ksh 50,000. When farmers default due to bad weather which results in poor harvest, the farmer will be given an indefinite time to re-pay the loan".

Management

The Saccos are managed by the farmers themselves. They hold an annual general meeting to discuss matters arising from the running of the societies. A team of 60 delegates are elected to spearhead the running of the societies. These then elect within themselves nine directors who run the Saccos. They arrange and organise several meetings through out the year and do not earn a salary for their work. Instead, they receive a seating allowance. "The elected delegates must meet certain criteria. This includes having shares amounting to Ksh 50,000 in value. Without proper management, the society may end up splitting and forming other societies. At one time we only had one Savings and Credit Society serving the big Mathira Division, but it was split into 13 different societies", said Mr Githinji. "Sacco has to work competitively to attract farmers", he adds.

Savings in the club are foresight's granary and drop by drop, palm wine fills the canary.

Saccos to be regulated

In Kenya there are more than 4200 Saccos, controlling about Kshs110 billions in members savings and shares. There has been no adequate framework or legislation to safeguard member's savings and stop mismanagement. As a result the Ministry of Cooperative Development and Marketing is working on Sacco societies regulatory bill, which is currently at the drafting stage. The bill is intended to regulate Saccos and ensure they are well managed to serve members and protect their savings. It is expected that if regulatory mechanisms are put in place Saccos can move higher and provide long term financing. (TOF)

Goats improve income for rural women

The goats have helped improve nutritional levels and income for families of Nakuru women group

By Peter Kamau, Ngorika

Eight years ago, 42-year-old Margaret Wanjiru together with other women from Ngorika village in Nakuru District formed a women's group. The women who started off by raising money among themselves would each take turns to receive a lump sum of money to cater for their urgent needs such as paying school fees or buying household goods.

A local Non Governmental Organisation (NGO), Farming Systems-Kenya who heard of the group, advised the women to try zero grazing cattle. They took the advice and formed the Kunyotoka Zero Grazing Women's Group. "After paying Ksh 2,000 to the group, a member would receive a heifer whose offspring would be given to the next member who would also pay Ksh 2,000. But we soon realised that the size of land was too small to adequately cater for cattle rearing. Many of us then switched to dairy goat rearing instead", Wanjiru says.

Multiple births

Wanjiru was lucky. In 2000, when she heard about the benefits of dairy goats, she sold her only cow and bought a female goat. On first conception it produced triplets. On second conception, it produced quadruplets and all the kids survived. By the end of the year, she had seven goats after giving up one of the kids to another group member. By last year, this goat



Kunyotoka Group members at their goat demonstration shed.

(Photo TOF)

produced five kids which are all doing well.

Built a house

"Dairy goat keeping has brought a big change in my life", Wanjiru says. After selling some of the goats, she was able to pay school fees for her children, buy a water tank and build a new house. With the income, she is able to take care of her parents. Each goat produces an average of three liters of milk per day. Her family now has more milk than it need and the surplus is usually sold. Apart from milk production, the goats have provided her with good quality manure which has helped improve the quality of soils on her 3-acre-farm. As compared to keeping cows, Wanjiru says that goats require a small land area to graze. "Anybody can rear goats as they consume as little as 5 kilogrammes of feed per day," she says.

Grace Wacuka, 41, is the group's chairlady and a single mother of two. She says that most of the group members do not own land because most families have not yet sub-divided the land among their children. She says this is the reason why goat keeping is popular among the group members as it does not require a big piece of land.

"The goats have not only helped us improve our diet and nutrition, but have also become our major source of income. We are now able to supply goats to farmers in many parts of the Rift Valley Province who want to start rearing goats", she says.

A model for goat farmers

The Kunyotoka Women Group which now comprises of 25 members is one of the most successful dairy goats farming project in the country. The group provides training to many

farmers in the province on the techniques of dairy goat keeping. For a day of training, a farmer pays Ksh50. Each year, the group takes part in the annual Agricultural Society of Kenya (ASK) shows where it competes with other breeders. The group has often taken trophies home with them.

Unlike cattle rearing, dairy goat keeping does not require much care but owners are advised to keep proper records to ensure cases of inbreeding are reduced. To start with, the women group had to qualify for membership of the Nakuru Sheep and Goats Association, a local body that helps maintain standards for all hybrid sheep and goats in the district. After being trained on how to care for the goats, the group received four female goats and a male. In 2001, the Kenya Agricultural Research Institute (KARI) recognized the group's effort and donated four more goats.

"When the goat produces a female kid it is given to another member who pays a deposit of Ksh1,000. As a result, all our members have within a short time managed to own and keep a number of goats", says Wacuka.

Good earnings

Like Wanjiru, most women in the group have made progress in their lives since joining the group. Many of them have bought plastic water tanks, iron sheets, TV sets, cooking gas and even purchased farm inputs with earnings from the goat sales. Most members sell up to three goats in a year. A female goat sells for 8,000. For each goat sold, five per cent is deposited to the group's account. In addition, the Breeders Association which regulates and helps maintain quality standards in the dairy goat project charges a levy of 10 per cent for every goat sold.

Interested in goat breeding?

If you need more information, contact:

Kenya Dairy Goats Breeders Association, P. O. Box 2816, Nakuru, Tel: 051 22 111 77

There are two publications:

- Keeping goats in Kenya, by Ian Skea, published by Ministry of Livestock Development, copies are available at Agricultural Information Center, Waiyaki Way, P. O. Box 14733, 00800 Nairobi

- Training Manual for keeping and breeding goats, by Farming Systems Kenya, P. O. Box 2816, Nakuru, Tel 051 2111 77,

e-mail: fsk@africaonline.co.ke

Dairy goat farming is easy

The dairy goats need good shelter and care. In addition, the farmer has to keep proper records.

The Organic Farmer

Except for pastoral communities in Northern Kenya many people in the country do not like goat milk. Farmers keep or buy goats for meat. But goat milk is nutritious and unlike cow milk, it contains fats and proteins in a more refined form that is easily digested by children and adults.

That is why it is recommended for infants, sick people and those recovering from illness. Indeed many children are often weaned on goat milk when they reject cow milk. Unlike cow milk, goat milk is said to be free from most of the disease causing pathogens which are responsible for tuberculosis.

Breed

The most common dairy goat breed in the country is the Swiss or British Toggenburg. The British type is bigger and can attain up to 70 kg with some males growing to 100 kg. The Swiss type is smaller, ranging between 50-70 kg. The goats are brown or grayish brown with white stripes on the face and legs. The Swiss type is longhaired. The Toggenburgs are intelligent and are easy to handle and train. However they must be well fed to produce milk. The other popular breed is the German Alpine.

Farmers wishing to buy these hybrid goats are advised to do so from breeders who are registered with the Kenya Stud Book (KSB). This is a secretariat of the Kenya Livestock Breeders Organisation (KLBO) that maintains records of farmers who

Benefits of a goat

Felistas Kibutha from Ruthimiti village in Wangige likes goat milk. Her extended family consumes much of the milk from her 3 goats. She sells the surplus at Ksh 50 a half litre. She prefers goats, since they are not heavy feeders and are easy to sell when she needs money.

(Photo by TOF)



own hybrid goats and other livestock. The goats are inspected regularly and farmers issued with certificates to show the animals meet set standards.

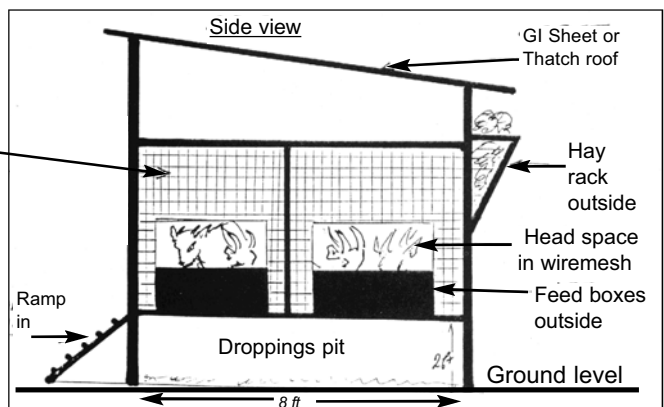
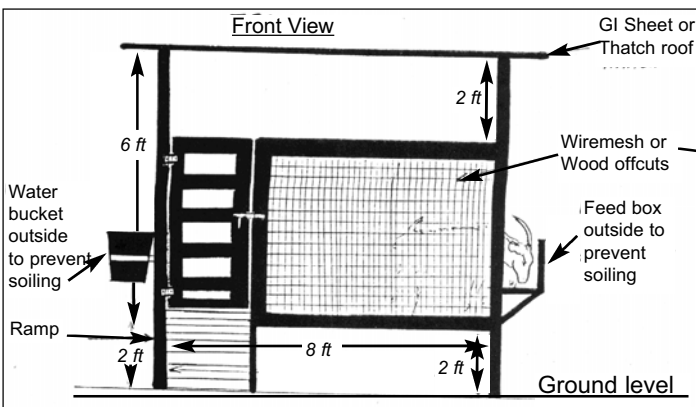
Housing

Farmers are advised to avoid keeping the goats on free range. They should be properly housed in well-ventilated sheds with slanted floor to allow flow of urine and other waste. The shed must be kept clean. Structures made of cedar posts or any strong material are recommended. The farmer should use corrugated iron sheets for the roof and timber offcuts for the walls.

Record Keeping

The farmer should ensure the goats are regularly de-wormed. They should also be de-horned and their hooves trimmed regularly with a sharp knife. Good husbandry practice involves the maintenance of records on each goat to help in their management. Details such as the name of goat, breed, date of birth, parent information, date of service in case of does, including milk records are important. The goats also need branding with tattoos, ear tags or notches. This depends on methods of identification recommended by the rules of the Kenya Stud Book.

How to build a goat shed



Why maize has black tassels

Nyuthe Nduati and fellow farmers in Ngorika area in Nakuru are concerned about a disease which is devastating their maize crop: "A black lump grows on the tassels and the maize ear or cob. All that remains is a black powder on the cob and the tassel. What can we do to control this disease or eradicate it altogether?"

The maize sample sent to me from the farmers in Nakuru was infected with Smuts. Smuts is a fungal infection which affects the cobs and tassels of

humans animals etc creating havoc in their path and may stay in the soil for many years. The solution to this problem is to identify infected plants very early before the pouches burst and to destroy them by fire. Do not put this affected material into compost pits. There is no known cure or prevention other than vigilant crop husbandry, where soils are kept at optimum fertility through good crop rotation in order to prevent re-infection.

This fungus also affects Sorghum with similar symptoms thus neither of these crops should be grown in an affected area for a minimum of three years. Take note of neighbouring fields of crops as this disease can spread between shambas. It is important to note that Smut can originate from poor maize seed, thus it is advisable to buy seed from a reputable source. Do not plant your own seed if you have this problem.

A maize plant affected by smuts: the disease has caused huge losses to the farmers in Nakuru. (Foto TOF)



Su's answers

the maize plant. The affected areas look like white swollen pouches which if left later turn black and burst releasing myriads of black spores into the environment. The maize plant becomes non productive and in fact a cause of contamination for the entire maize crop. The fungal spores may be carried by wind, water,

Stalk borer becoming a threat

Duncan Mwangi of Ngorika wants to know what methods he can use to control stalk borer which is devastating the maize crop. He has tried all pesticides but they are not working.

Stalk borer is a serious pest in all maize growing areas in Kenya. It is identified by perforation of the upper leaves caused by the larva of the borer which sit inside the funnel of the maize stalk, feeding off the new tender leaves. Early infestation will cause stunting of the maize plant and if left untreated will result in the larva progressing to infecting the newly formed cobs, drastically reducing yields and storage quality of the maize.

To effectively treat this pest, the larva must be eradicated at an early stage. It appears from the question posed by Duncan Mwangi of Ngorika that he has finally created a resistant borer that is not affected by conventional pesticides, caused by his continual use

of the same. His solution now is to look at bio pesticides such as Neem cake, Pymac and diatomite all of which when sprinkled into the funnel of each maize plant, will control the problem. Sprinkling must be done at early symptom stage and carried out again when symptoms reappear.

Store at a dry place

It is very important to keep close vigilance on our crops as organic farmers knowing prevention and early intervention is crucial. Secondly, at maturity the crop must be harvested as soon as possible and all cob leaves must be removed. This is because the borer may still be present in the leaves covering the cobs. The cobs must then be sun dried and stored in a well ventilated maize storage area. At this stage, diatomite should be sprinkled on the cobs to prevent infestation of both the borer and weevils. Diatomite is locally available as Kensil. It is non toxic and therefore very safe to use. It does not need to be removed before cooking of the maize.

Control the weevils

John Kiragu of Molo would like to know the causes of weevil infestation of maize while still in the shamba. Is there a way we can control the weevil at this stage?

Firstly, weevils affect drying or dry maize. There is no way of controlling weevils in the field because they hide inside the cob leaves. Therefore to control weevils, the crop must be harvested at maturity and sun dried as quickly as possible with leaves stripped off the cobs. Then same treatment as above for storage applies for weevils - dusting with diatomite. Also putting leaves of Neem trees or Lantana in between layers of maize cobs will help, store in a well ventilated maize store protected from rodents, and your yield of maize will keep for a long time.

Storage of grains

All grains must be stored with a maximum moisture content of 13% to avoid the on set of moulds which can cause serious health consequences e.g

Continued on page 7

Take care of your chicken

Ronald Mokaya Nyabuya, P.O Box 995, Kitale is asking for information about chicken (Hens) diseases affecting them, and medicine used.

Hens like plants must be given adequate nutrition and conditions for their survival. It is very important that the hen housing is dry as bacteria breeds in moist conditions. It is also important that the temperatures of the hen house are neither too warm nor too cold as this will affect the energy levels of the hens. Conditions that are too hot result in more water consumption than feed and constant heat stress of the hens. This applies to both, broilers that are grown for meat and layers grown for egg production.

Chickens that are kept in housing that is too cold will burn their energy trying to keep warm. The resulting effects will be stress and low egg production, weight gain and a reduced immunity to disease. As with plants we try to create strong immunity, so too with hens, in fact any and every livestock, in fact any living organism, life in general.

A happy hen must have access to clean drinking water, dry grains free of fungus, fresh organic greens, sunlight and an area to run and play. In the case of layers, a comfortable private slightly dark laying area is essential too.

Sick poultry can spread disease very quickly. Sick chickens must be quarantined from the rest of the flock as soon as illness is realised. Diseases

Continued from page 6

Aflatoxins. Some simple guide lines can help us determine the correct moisture content.

1. If you can bite through already dried grain, it is not yet dry enough.
2. If you CANNOT bite through a grain kernel, chances are it is dry enough for storage and will not develop fungal growth.

These very simple details could be life saving. If you can eat an uncooked grain, so can a fungus.

Diseases in our crops become more common as we upset the natural balances of nature. We must strive to create healthy soils by the incorporation of nutritious organic matter as well as crop rotation so that at every level, starting with the soil, there is a balance. When this is achieved, ours will just be a matter of scouting and slight intervention as our crops will be healthy and able to resist most problems.



vary in degree of severity and a visit from a vet will help in identifying absolute problems. If medication is necessary ask your vet for natural alternatives if any.

We use EM

To ensure our chickens have strong immunity, we add EM to their drinking water and have done so from day 7 of their lives. This helps them with better feed conversion, vitality and strength. We also feed them loads of organic green materials from the farm. Sometimes we do have a chicken that succumbs to illness. More often than not, we remove this bird from the flock immediately. In quarantine if the bird does not show signs of recovery, we cull it, cook it and feed it to the dogs.

If you have a continuous problem with disease and chickens, it is advisable to get rid of the entire flock. Before starting a new flock, clean out and rest the chicken housing for at least 2 months. Or try something new. I have just read a story about a farmer in the States who rotates his livestock! Every 6 months he rotates his livestock into a different housing area. He moves his pigs to the chicken area, cows to pigs and chickens to cows. He believes the disease and bacteria that effect one group of animals cannot survive or cause damage to another. And it works! We rotate our plant groups for exactly this reason!!

Be sure to let us know the action and results with your chickens!

Earthworms and Termites

Joseph Gachie Kiragu from Nyeri will know more about earthworms and termites.

Termites require a high, possibly dry carbon content in their feeding material. They are not likely to be found in a very wet manure.

Termites are regarded as pests in situations where they destroy wooden structures. However, in the organic garden, they are very useful and necessary in speeding up the first stages of decomposition of organic matter with a high carbon content, e.g. straw and wood shavings. Where they are pests they can be controlled by sprinkling diatomite directly onto their bodies, or in an area they must pass (see: Diatomite, page 2).

Earthworms

Earthworms are a good sign. They do not eat roots, but rather digest decomposing organic matter and make it readily available for plant uptake. They also help to aerate the soils they inhabit. They are a sign of healthy soil, compost or manure. They will be found where conditions are right, soil acidity, temperature, humidity and availability of food. The conditions of the manure in which they were present, suggests optimum conditions were present. In



manure where they are absent, the opposite is true.

Prove it yourself: Sift 2 square feet of soil from your best farm area. Count the earthworms. Do the same with soil from your worst area. Count the earth worms. Earthworms = healthy soil = healthy crops = healthy YOU!

Su Kahumbu answers your questions



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Farmers can control potato bacterial wilt

Crop rotation and careful potato seed selection are the best measures which farmers can take to control the disease.

The Organic Farmer

Many farmers across the country are still unable to control bacterial wilt in their farms. As a result the disease is still affecting production in many potato-growing areas. However, it is important for farmers to know that although the disease has no known cure, it can be easily controlled or even eradicated if only they can follow simple rules to manage it.

As we said in our May issue, potato growers should ensure that where the disease is identified, they should never replant the same field with potatoes or any other crop in the potato family. This includes tomatoes, bananas, eggplant, capsicums, pepper and groundnuts. Fields affected by the disease should never be planted with these crops for a period of up to four years. During this period, farmers can plant other crops that are not attacked by the disease. These include beans,

maize, cabbages, sorghum, wheat, onions, carrots, sweet potatoes or grass.

Positive selection

Farmers should always ensure they get good seeds from established seed growers working with the Kenya Agricultural Research Institute's National Potato Research Centre (KARI-NPRC) at Tigoni. Where a farmer has no way of getting clean seeds, he can practise what is called positive selection. This involves marking healthy potato plants with pegs at flowering stage, after harvest these are stored as seed to be planted in the next season.

Selecting the best potato plants for seeds has been found to increase potato production by 50 per cent in areas affected by bacterial wilt. But farmers should know that this method only reduces the disease's prevalence and does not eradicate it.

Mode of infection

Farmers should ensure that infected plant material such as tubers, crop residues, contaminated surface run-off

water or irrigation water spreads the disease. Infected soil on shoes and farming tools such as jembes, fork or even tractors can transmit the disease. Pests and insects in the soil also spread the disease.

Affected plants wilt may appear like those lacking water; farmers can confirm the disease's presence by cutting a tuber from the wilted plants and squeezing it. If a white creamy liquid (which contains the bacteria) comes out, this confirms the disease's presence.

Many weeds serve as alternative hosts for the bacteria. They must be removed to reduce its presence in the soil. Volunteer potatoes (potatoes from the previous harvest which grow on their own) should be removed.

In cool areas of the country with an altitude of 2,500 metres, the bacteria can hide itself in healthy plants only to re-emerge when potato seed from these areas is replanted in warmer lowlands. Buying certified seed and planting these on uninfected soil is perhaps the best way to avoid the disease.

Important tips for bacterial wilt control

How to identify the wilt

- In rapid disease development, the potatoes do not change colour.
- In the long term, the potato leaves turn yellow.
- The plant is stunted. Sections of the diseased plant may wilt completely and dry up, while the rest appear healthy.
- There is a dark brown colour in the inner section of the stem.
- Heavily infected tubers have soil stuck to the tuber eyes.

How to handle infected plants

- Remove all infected plants and tubers with surrounding soil and put them in a 2 feet deep pit and cover with clean soil or burn them.
- Do not put diseased plants in your compost heap.
- The plants next to the diseased plants should be harvested only for consumption, not for seed.

How to select good seed

- Use clean seed or tubers of tolerant varieties bought from reliable sources such as Kenya seed Company or recognized seed growers.
- Disinfect all tools with household bleach (Jik solution) before and after use.
- Avoid planting in low-lying and waterlogged areas.
- Plant only whole undamaged tubers.
- Weed regularly and cover the potato crop properly with soil.
- Taking care not to damage roots and stems.
- Ensure that farmyard manure and compost are fully decomposed to avoid spreading the disease.
- Check field regularly for wilt and other diseases.
- Do not put diseased plants tubers on your compost heap.
- Do not buy potato seed from neighbours.

Useful addresses

Farmers can buy clean potato seed from the following producers:

Central Province

1. Gathaiti Pioneers Group, Tel: 0721 341 655, Kiambu
2. Mr. Kelly Ndung'u, Tel: 0722834 725
3. Mr. David, Tel: 0720 376 478, Meru
4. Midland Ltd., P.O. Box 20529, Nairobi, Tel: 045 40206, 41209

Central Rift

1. ADC Marindas Farm, Molo
2. Samwel Ketyenya, P.O. Box 104, Keringet, Tel: 0722 898 805

South Rift

1. Sara Macharia, Tel: 0735 263 607, Trans-Mara
2. John Maleke, Tel: 0735 589 294, Trans-Mara

North Rift

1. Kerio Trade Winds, Mr. Moiyo, Tel: 0720 220 641
2. Philip Ruto, Tel: 0721 918 667
3. Mr. Powon, c/o KARI, P.O. Box 450, Kitale, Tel: 0733 893 140



Letters to the editor

Change attitudes

I salute the editorial board of organic farmer magazine for the good job you are continuing doing in bringing to our attention about organic farming. It is now five months from the time the magazine was launched i.e. April 2005. Here in Nakuru and Nyandarua districts farmers, frontline extension officers, farm manager and other relevant learning institutions have been receiving all the five copies and are quite happy for the good formative information concerning organic production and opening other channels in organic value chain. The magazine has reached over 10,000 farmers, through farmer groups in our region.

The magazine has been an eye opener for all players in organic production. It is now high time farmers and other organic experts join hands and pull resources together for example in information sharing on production, value adding, marketing and other new Bio-products, also looking for appropriate techniques or measures to reduce the cost of production. Farmers require to be given the right and relevant information which is applicable and realistic.

May I extend my thanks to all other players who are promoting organic production to mention but a few, organic farmer magazine, KIOF, SACDEP, Baraka college, Manor house and others for their noble efforts. It is through participatory approach and serious training and campaign that will help in spreading and expanding of organic production in this country. It has come a time when farmers have to change attitudes toward farming and take farming as other business. Experts need to re-double their efforts and reach about 80% of the rural small and medium scale farmers who are still in the dark as regards modern farming.

If the above measures are consistently put in place the problem of unhealthy food in many regions shall be solved. The future seems brighter with organic farming.

Daniel Njoroge Kamau, 0721 350796

Very realistic

Greetings from agriculture and rural development programme (ARDP) Catholic Diocese of Nakuru. I hope and trust you are fine. I would like to acknowledge with sincere thanks receipt of *The Organic Farmer* magazines that you have been sending to us on monthly basis. I thank you very much on behalf of the programme staff and the farmers we are working with.

The magazine is very realistic and applicable to the farmers. I want to assure you that we are trying our best to make sure that all the magazines reach the farmers. We will also in future try and contribute to the magazine. Kind regards.

Daisy Rono, ARDP Coordinator

Visit us

I hereby kindly request you to visit our group. Our group holds its meetings on Wednesday every week, so we expect your visit. Thank you.

Alex Makau, P.O Box 1232, Kangundo, 0735565849

More copies

I thank you for your organic farmer magazine and request you to be sending me at least 2 copies for the nearby groups and schools.

John Chege Mungai
P.O Box 136
Ithanga Via Thika



It takes two days to sort, package and send out The Organic Farmer newspaper to farmers throughout the country. Last time Swiss Journalist Rudolf Kueng passed by to do a story on the newspaper. Here he is seen talking to Eric Lumosi, one of our writers who is also helping in the distribution. In the foreground is our office secretary Lucy Macharia sorting out the newspapers for despatch. (Foto TOF)

Cooperation

Mwakamuki small farmers organization is a community-based organization (CBO). It draws its membership from small-scale farmers at Kakuzi division in Thika. It has a membership of 70 members (families). We are pleased to send you this letter to cooperate with you the way in which we can get more advise on organic farming and the way we can control the pest. Thank you in advance and looking forward to your positive response and also your cooperation.

Mrs. Margaret Waringa, P.O Box 48, Ithanga

Valuable

I write to request for *The Organic Farmer* monthly. I have read the last several issues with my friends and found it very valuable and impressive especially on how to make liquid manure and use it to top dress out plants in shamba. I am a catholic justice and peace commission Kabula parish chairman and a coordinator of Namawana Sub-location Self Help Group. We find that the organic farmer would be of much help to us. Thanks alot.

Cosmas Khaemba, P.O Box 13, 50124, Kabula Via Bungoma

Form your own farmer group to get copies

I have the pleasure to say thanks for your July issue and this is my first time to receive your newspaper. And I am saying thanks for your services. I want to ask you some questions:

- 1) I want you to explain well about the organic farmer services?
- 2) In your letter, I saw you are dealing with the groups and my question is, would you like to organize my group here?

I hope you will answer my questions and thank you in advance. I am

looking forward to the next issue of the newspaper.

Eustus Gakere, P.O Box 33, Kiganjo, 0721 588163

*Dear Mr. Gakere,
We are encouraging farmers to form groups for the purposes of receiving the newspaper through one address- NOT officially registered groups. The reason we are doing this is to help cut the cost of sending the paper to each individual farmer. In this way we can be able to reach more farmers.*

The wasps that save farmer's cabbage

ICIPE introduces farmer-friendly alternatives with biological control to protect the cabbage against the Diamondback Moth.

By Liz Nganga

Cabbages and kales are the most important vegetables in the region, especially for lower income groups. The importance of these vegetables is probably greater in Kenya than other African countries. According to the Ministry of Agriculture, in Kenya they occupy over 18,000 hectares.

Eaten daily, either raw in salads, steamed, boiled or fried, cabbages and their cousin kale serve as important cash-generating crops in many households, and are used as fodder for animals. Grown in all of Kenya's eight provinces, with Rift Valley and Central province jointly making-up 82% of the total production, cabbages have the potential of being an economic enterprise, and could contribute to poverty reduction.

Low returns

So far, however, cabbage production has generated less than satisfactory income. The average yield of 13.8 tonnes per hectare per year is very low, and at an estimated Ksh10 per kg generates about Ksh 138,000 per hectare, working out to Ksh 2.61 billion per year for the entire production in Kenya.

Various factors have contributed to the low yield and returns, the most important being insect pest damage, which can lead to up to 100% loss if not controlled. One of the cabbage's major devastating pests is the Diamondback Moth (*Plutella xylostella* DBM), a small greyish-brown insect which gets its name from



Larva of Diamondback moth. . .

a diamond pattern on its back, seen when its wings are closed at rest.

Small insect, big damage

Despite its minute size - 8 mm in length with a wingspan of about 15 mm - the moth causes damage often sufficient to ruin cabbage heads to a level where they are no longer marketable and contaminates the heads with larvae or faecal waste. The moth's destruction to the cabbage, and other host plants such as cauliflower, broccoli, radish and turnip, is felt at all stages of its 15-17 day lifespan. Feeding by the larvae damages leaves, making them appear skeletonised.

Control of the moth has remained a tricky issue. This completely cosmopolitan pest, which tolerates the tropical, subtropical and temperate climates, extending as far north as the Arctic Circle in Europe, is notorious for developing pesticide resistance. In Kenya and the East Africa region, ICIPE, the International Centre for Insect Physiology and Ecology, is making great strides in the control of the moth as part of the Centre's research into the pests of staple food crops and horticultural crops. ICIPE is working with partners to develop Integrated Pest Management strategies



. . .and its enemy, the wasp

that will provide farmers with affordable solutions to the moth problem.

Biological control

Intensive studies carried round the world found biological control - the use of a living organism to control pests, implemented through conservation, augmentation and importation of natural enemies - of the Diamondback Moth safe and sustainable.

Use of chemical pesticides for control often leads to serious environmental problems, besides affecting the health of users and consumers. In addition, chemical pesticides eliminate the natural enemies of the moth, thereby creating the need for more pesticides and causing the build-up of considerable residue levels in subsequent cabbage production. This in turn increases production cost and development of resistance. Ironically, in order to overcome resistance, farmers have resorted to applying higher doses of insecticide cocktails more frequently, making control more complicated.

In 2000, ICIPE started a project to introduce parasitoids (natural

Continued on page 11



Nothing left to harvest: Infested cabbage



Cabbage crop 2 years after releasing wasps (Photos courtesy of ICIPE)

Continued from page 10

enemies), which are a major feature of Integrated Pest Management. The project commenced with a survey in the major cabbage growing areas in Kenya, Uganda and Tanzania, which showed that existing enemies were not providing a big enough impact in control of the Diamondback Moth. ICIPE therefore imported an exotic parasitoid, a parasitic wasp (*Diadegma semiclausum*), already being used in a number of countries in South East Asia (Taiwan, Indonesia, Mainland China). The wasp stings the Diamondback Moth larvae, lays its eggs, which hatch into larvae, which feed on the internal organs of the moth causing death. The wasp's larva pupates in a cocoon inside the loosely



Releasing wasps in the field near Karatina

spun webbing of the moth larva and remains stuck to the leaves. The adult parasitic wasp then emerges after a few days.

Good results in Taita Hills

A number of trials were conducted at the Centre's laboratories before a permit was given for the release of the wasps in Kenya, which was initially done in July 2002 in Kisii, Taita Hills and Muguga. Sites were visited every fortnight and data collected to find out if the natural enemy was getting established. Results showed a reduction on the number of Diamondback Moths in the fields, and of the damage on crops. In Taita Hills the wasp destroyed the Diamondback Moth at a rate of 60 %, and in Tanzania areas visited after eight months were observed to have the natural enemy spread widely with an average 30% parasitism, though some recorded as high as 80%. In Uganda,

the wasps were released in November 2003 and data collection will begin soon. Uganda was also the second country in Africa to have a second natural enemy released - the *Cotesia plutellae*, which is appropriate for semi-arid areas.

KARI takes over

Rearing, release and monitoring activities are now in the hands of the Kenya Agricultural Research Institute (KARI) Muguga Biological Control Station. Several districts in Kenya have benefited from the release of the wasps, mainly Meru, Nyeri, Embu, Maragua, Kiambu, Naivasha and parts of Nakuru and Nyandarua.

In most situations, the released parasitoid will completely control the pest without any additional activity required by the farmer. However, says ICIPE-Scientist Dr. Bernhard Loehr, "farmers should regularly scout their fields as there are other pests like aphids that might require treatment. Spraying against Diamondback Moth is only necessary when there is an average of more than two pests on the scouted plants in the dry season, and more than three in the wet season". There are a number of neem-based products available in Kenya which can be used in organic agriculture and give a satisfactory control of Diamondback Moths and aphids.

Managing pests, diseases and weeds

The biological pest control as explained on page 10 is important for organic farming. There are many ways to manage pests, diseases and weeds.

The Organic Farmer

The approach described here is to protect crops from damage caused by some pests, diseases and weeds by strategically placing other pests and weeds to serve as predators or deterrents. For commercial and conventional farming, a low incidence of all pests, diseases and weeds is considered necessary for maximum yields and product quality. Relatively large sums are spent on buying chemicals and on research to find new chemicals to sanitize fields. Many pests and disease have developed resistance to the chemicals used making more research and chemicals necessary. Other pests and diseases are able to develop because their natural enemies have been killed. This approach is short sighted and does not take natural systems into account.

For sustainable agriculture, the approach is to control stressed food

Climate change a threat for Africa

Climate change threatens to increase the number of the world's hungry by reducing the area of land available for farming in developing countries, a report of the UN-Agriculture Organizations says. "In some 40 poor, developing countries, with a combined population of two billion, including 450 million undernourished people, production losses due to climate change may drastically increase the number of undernourished people, severely hindering progress in combating poverty and food insecurity".

The severest impact was likely to be in sub-Saharan African countries, which are the least able to adapt to climate change or to compensate for it through increased food imports. In Africa are 1.1 billion hectares of land with growing period of less than 120 days. Climate change could, by 2080, result in an expansion of this area by 5 - 8 percent, or by about 50 - 90 million hectares, the UN-organization said. Sixty-five developing countries, home to more than half the developing world's total population in 1995, risk losing about 280 million tonnes of potential cereal production as a result of climate change. (TOF)

webs, predators, life cycles and other aspects of the ecosystem. In the natural balance, each organism, including pests, diseases and weeds, serves one or more functions. If an organism appears not to be useful, it is usually because all its roles in the system have not been discovered or acknowledged. The terms 'pest' and 'weed' need to be redefined to include the positive roles these plants and organisms sometimes play in agriculture.

For example, weeds may serve as a resource for production because they can be used for composting or mulching. Their presence in a field is an indicator of healthy soil. A few pests on crops are needed to keep the predator population functioning in the process of biological control without causing a significant reduction in yield.

It is important to understand the cycles of pests, diseases and weeds to find out when certain natural control methods are needed.

Source: *Production without Destruction, Natural Farming Network Zimbabwe, 1995*

Farmers can do a lot to control spider mites

In the August-issue of The Organic Farmer we wrote about pyrethrum. ICIPE-Scientist Dr. Markus Knapp gave us some more tips how to control spider mites.

By Markus Knapp

In the last issue *The Organic Farmer* pointed out very clear, that early recognition is very important for controlling spider mites. The spider mites prefer the lower side of the leaves and only go to the upper site, stems and later even fruits of the lower leaf surfaces are over-crowded. The spider mites can be reddish brown, bright red, orange, greenish or yellowish. Spider mites are very small. What you can see without a magnifier are only the adult females. If you check with a magnifier you will see many smaller mites (these are their children) and eggs, which look like small white or yellowish balls.

Support tomatoes with sticks

Because the spider mites are on the lower side of the leaves it is very important that you cover these places when you spray. This is very difficult in tomatoes, which are not staked. Putting a stick and tying the plant to it lets the tomato grow more upright and makes spraying easier. Pruning (removing shoots that are not necessary) helps even more. Then turn the lance of your sprayer around and spray from below to reach the lower side of the leaves. It is also very important to have the right sprayer nozzle and make sure that it is working well. Replace the sprayer nozzle every year. Never use a piece of wire or any other thing to clean a clogged nozzle. It will not work properly afterwards.

For efficient spider mite control the plant must be covered completely with the spray solution, of whether you use a botanical or a synthetic pesticide. Scientists have shown that surviving mites can find small areas that were not covered during the spraying and feed and lay eggs there until the pesticide is not effective any more. In Zimbabwe it was found that yield and quality of staked and pruned tomatoes was much higher than of the one grown without a stick.

Terrible pest from Brazil

The two most important spider mite species (types) in Kenya are the tomato red spider mite and the two-spotted spider mite. The tomato red spider mite is not native to Africa. It



Spider mite web on a tomatoe plant. The red points on top are female adult mites waiting to be blown by the wind to the next plant for getting more food. (Photo courtesy of ICIPE)

was introduced accidentally. We do not know exactly where it comes from but we suspect that its home is South America. It was found for the first time in Kenya in 2001. This mite prefers tomatoes and its relatives like potatoes and eggplants but it can now also be found on beans.

Predatory mites are the most important natural enemies of spider mites. They are also small and usually whitish to yellowish in colour. They move much faster than spider mites because they have to hunt for their food while the spider mites just walk around slowly and prick the leaves. However, we have never seen predatory mites feeding on the tomato red spider mite. This is very common when pests are transferred from one area of the world to another. The native natural enemies do not attack it because they are not used to it.

ICIPE has therefore established contacts to research institutions in Brazil to search for natural enemies in South America. Early last year predatory mites were found on tomato plants infested with the spider mites. These predatory mites were further tested in the laboratory in Brazil and found to do very well. ICIPE has now obtained a permit from KEPHIS to import this mite and keep it in the quarantine laboratory at ICIPE for further testing. Before it can be released into the field another permit from KEPHIS is needed.

Take care with pyrethrum

The two-spotted spider mite has many more host plants. It can be a problem on beans, squash, pawpaw, okra, roses, carnation and other flowers, even maize and many other plants. There are predatory mites and other natural enemies (e.g. small ladybird beetles) feeding on the two-spotted spider

mite in Kenya. However, these natural enemies are usually more susceptible to pesticides than the pest. You should therefore use pesticides (botanical or synthetic) only when it is really necessary. This is of special importance with pyrethrum because it kills all bugs, good ones and bad ones. If you want to use neem to control spider mites, look for a product that contains a high proportion of neem oil because it is more effective. However, it might also damage your plants. Therefore try it on one plant before you spray the whole field.

To reduce spider mite pressure on your farm remove and burn or compost all plant leftovers immediately after harvesting in terminated. Don't leave them in the field until you need it again to plant something else. These old plants are ideal breeding grounds for spider mites. When there is nothing to eat any more the mites will move to your new crops. Because they are small and cannot walk far, they use the wind for distribution. When the host plant is exhausted they move up the plants and wait to be blown away. That is the reason why you sometimes can find huge numbers of orange mites on the web on top of plants or even on the top of sticks used for staking tomatoes. From there they are blown into your new crops by the wind.

The Organic Farmer

in November

Why not
plant
Soya
beans?

