

The Organic Farmer

The magazine for sustainable agriculture in Kenya



Nr. 36 May 2008

Proper management increases potato yield

Lack of seeds and poor management of diseases is to blame for the low potato yields.

The Organic Farmer

Despite the increasing demand for potatoes in the country, production of this commodity is still low. At the moment potato prices are at an all time high. This means that farmers need to put more effort to increase production. To increase the yields, they have to adopt the right methods of production including pest and disease control.

One of the biggest threats to potato production is the spread of bacterial wilt. There are two reasons why this dangerous disease is spreading so fast. One of them is that farmers do not practise crop rotation (see box below).

The second reason for the decline in potato yields is lack of clean seeds. Many farmers just take potatoes they harvested the previous season and use them as seed. If such potatoes are affected, then the disease spreads to other parts of the farm previously not affected. Farmers should take the



trouble to find out if there are genuine seed producers in their area. Alternatively, they can seek advice on where to buy potato seeds from agricultural extension officials or KARI stations near them. To get good potato yields, farmers should also be able to control other potato diseases such as Early and Late blight.

All about potatoes on page 4 & 5

Controlling bacterial wilt

Bacterial wilt can be very destructive at the lower altitude, but it has spread to all high altitude areas in Kenya. This disease causes rapid wilting and death of the entire plant without any yellowing or spotting of leaves. The pathogen is transmitted through tuber seed into the soil. Also infested soil can be important source of the disease. To a certain degree, crop rotation can help to fight bacterial wilt.

- Potatoes should never be planted in the same field for two seasons. They should be rotated with either maize or beans but not any other crop in the potato family such as tomatoes, peppers or bananas.

- If a field is affected, do not plant potatoes for several years. Farmers can plant maize, beans, cabbages or sukumawiki which are not prone to the disease.

- Potatoes should never be planted in low-lying or water-logged areas.

- Potatoes from the previous harvest



This potato plant is affected by bacterial wilt (Photo courtesy: Infonet)

which grow on their own should be uprooted, burned or buried.

- Check the potato shamba regularly, remove all infected plants and tubers with the surrounding soil and put them in a 2 ft deep pit and cover with clean soil, or burn them.

- Do not put diseased tubers in your compost heap.

Pineapple as an alternative

Many young farmers are asking us about new ways to boost their income from agriculture. They are eager to try new methods of farming and new crops which can fetch a good price in the market. In this issue we answer some farmers: Read more on page 2 about a new crop, pineapples. (TOF)

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Why are food prices rising?

Food prices are on the increase worldwide: People have to dig deeper into their pockets to buy maize, rice and wheat, the staple food in most countries. The poor in cities who do not farm are especially affected.

The reason is the increasing demand: Apart from human consumption, more and more cereals are being processed as animal feed or biofuels. On page 6, we will explain what makes food more expensive. (TOF)

Dear farmers,

Once more, we bring you additional information on potato production. The reason as to why we put so much emphasis on potatoes is simple; they occupy an important place in Kenya's food security. Indeed, they are the second most important crop in the country after maize. 2008 is the International year of the potato - this should remind all farmers in the country to think more about this important crop.

Although the overall annual potato production has increased due to more land being put under production, the yield per unit area has decreased due to poor methods of potato management, lack of quality seeds and the spread of potato bacterial wilt disease. Local farmers get an average of 30 bags an acre, yet with good management, a farmer should be able to harvest up to 120 bags per acre. Demand for potatoes is on the rise especially in the urban areas where potato chips are the staple food for the urban population. A number of factories have also been set up to process various products from potatoes, for both local and the export market.

What we are saying here makes economic sense. The increasing demand for potatoes should be an opportunity for any smart farmer to produce more and sell it to boost their income. One way they can do this is to adopt the right production methods including the control of pests and diseases, as we write on pages 4 and 5. Nobody is too old to learn new things!

Diversify by growing pineapples

Except for big companies, very few local farmers grow pineapples, yet they can make good money from this fruit crop.

Ben Kariuki, Thika

A farmer who grows a variety of crops always finds himself with a steady source of income. When the price of one crop goes down, the price of the other may remain stable or shoot up, therefore cushioning the farmer against loss of income. Pineapples are one such crop. Farmers growing pineapples are very few in the country. Most farmers do not know the value of this fruit crop, let alone how to grow it. The price for one piece ranges between Ksh 40 and Ksh 80 depending on the size. In Kenya, pineapples are grown commercially in Thika.

Varieties: There are two main varieties, wild and smooth cayenne.

Production requirements

Pineapples grow well in all altitudes, from sea-level to an altitude of 1800 metres above sea level (masl). But the fruit tends to differ in taste, size and disease tolerance. At the coast,

the fruit is larger and sweeter; with a large core and less disease incidence. Above an altitude of 1,750 metres the fruit is very acidic.

Rainfall: Pineapples can do well in areas with as little as 750 mm of well-distributed rainfall. They can also be grown under irrigation.

Soils: Soils must be well-drained. The crop does well on an optimum pH of 4.5 to 5.5. Black cotton soil, low-lying areas and red loams that are likely to flood and should thus be avoided.

Land preparation: The land should be well prepared before planting. Poor land preparation tends to reduce yields and quality of the pineapples. Plough to a depth of 45 cm. When using hand labour, dig as deep as possible using a forked jembe. After digging, the soil should be broken down further into a fine texture.

Soil fertility: It is important to do a soil analysis in order to determine the soil nutrient level.

Crop rotation and land fallow: Farmers should leave the land fallow for up to 6 months. Crop rotation is also important in order to eradicate root-knot nematodes which can cause great damage and loss of pineapple crop.

Mulching: Use of black polythene paper of 150 gauge is recommended, this helps to maintain high soil temperature, retain moisture and even control weeds. In areas with high temperature use of mulch may not be necessary. Avoid use of grass mulch as it has been found to reduce yields.

Fertilizer application: Apply 5 to 10 tonnes of manure before mulching; this helps to give high yields.

Planting: Planting should be done at the beginning of the long rains. To get a good crop with a uniform growth, selection of size of planting material

is important. There are three parts of the plant that can be used as planting material: the crowns (the leaves on top of the fruit), the suckers (shoots produced from the stem leaf buds, and the slips (shoots that grow from the fruit stalk). If the planting material arrives earlier than planting time, stack them upside down and cover with grass.

Spacing: When growing pineapples under natural rainfall conditions, a spacing of double rows 60 cm apart, and 90 cm between the double rows is recommended. Plants should be 30 cm apart in the rows. One hectare (2.4 acres) can hold about 43,000 plants.

The colour is important

Pineapples are ready for harvest when they snap off at the bending of the fruit. Fresh fruits destined for the local market are plucked when almost ripe.

Fruits can then be cool-stored for up to 4 weeks (storage temperature around 7°C). Because of

their low sugar-content, pineapples harvested too early are unpopular amongst consumers (unripe pineapples do not ripen after harvest). The colour of the skin is an important criteria in determining the ripeness of the fruit. Fruits destined for the European market are often classified according to the extent to which an orange-yellow colouring has spread up from the base of the fruit:

- Ripeness-colour 1: Only the base is orange-yellow.
 - Ripeness-colour 2: The orange-yellow colour covers half of the fruit.
 - Ripeness-colour 3: The orange-yellow colour reaches three quarter up the fruit.
 - Ripeness-colour 4: The whole fruit is yellow.
- Only ripeness-colour 1 can be exported.

(Source: Infonet-BioVision)



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Use natural methods to control pests

The better you know the pests, the easier it is to control them effectively, the less the cost.

The Organic Farmer

Many farmers use chemicals to protect their crops. These chemicals are not only expensive but they also kill beneficial insects and other organisms that play an important role in the ecosystem. Besides, many pests have developed resistance to chemicals used to control them; that means that they may not eradicate the pests and diseases as desired.

One important practice in organic farming is to try as much as possible to maintain the natural balance. In the ecosystem each organism including pests has a particular role to play. A few pests in a crop for example are important because natural enemies which feed on these pests cannot survive if all the pests are eradicated. The natural enemies therefore manage to control pests biologically often without the need for the farmer to use chemicals.

However, it is important that farmers understand the various pests in order to control them effectively. The following are some of the major pests that farmers may encounter during the rainy seasons.



Diamondback moth larvae feeding on kales (top), an adult moth (below)



Diamondback moth

Diamondback moth (DBM) is a dangerous pest that attacks all plants in the vegetable family. It has a diamond pattern on its back where it derives its name from. In hot climates the pest breeds up to 15 times in a year. The Diamondback Moth larvae causes damage to the leaves. Newly-hatched larvae feed on the underside of the leaf penetrating the epidermis and drilling holes as they feed. DBM infestations are more serious during cool dry

months, but the pest is less likely to be a problem.

Control Method: Chemical control of DBM is becoming ineffective due to development of resistance. Neem-based extracts give good control of DBM-They are also harmless to natural enemies of the pest and are non-toxic to warm blooded animals. Widespread release of a parasitic wasp (*Diadegma semiclausum*) that feed on the pest larvae has been carried by ICIPE in almost all farming areas of the country. The wasp stings the Diamondback moth larvae, depositing an egg, which hatches into larvae that feed on the internal organs of the moth, causing death. Farmers are therefore advised not to use chemicals in DBM control as the chemicals tend to kill this important natural enemy of DBM.

Thrips



Thrips (inset), damage on a tomato leaf

Thrips attack onions, tomato, beans, passion fruits and many other plants. They prefer a warm climate and greenhouses in colder areas. Thrips usually feed on the lower surface of the leaves. Plant damage results from both larvae and adults puncturing the leaves and sucking the sap that comes out. Affected leaves have silvery colour with dark spots of waste matter from the pest.

When they are many, thrips cause premature wilting, retardation of leaf development and distortion of young shoots. Onion thrips transmit tomato spotted wilt virus disease in both green houses and field-grown tomatoes, but their damage is more evident in on seedlings making it an important nursery pest.

Control measures: Ploughing and harrowing can be useful in reducing subsequent thrips populations because it helps to kill thrips pupae in the soil. Overhead and surface irrigation has also been found to reduce thrips population. Intercropping onion and garlic helps decrease the level of thrips infestation. Repeated use of pyrethrum extracts can also control thrips. ■

Aphids

Aphids are a major pest in all farming systems. They usually feed by sucking the sap of a plant through the plant veins. All parts of a plant are vulnerable to aphid infestation. If their numbers are high, they can even kill the plant. They also transmit viral diseases as they move from plant to plant. Viral diseases of importance include potato leaf roll virus (PLRV), potato X potexvirus (PVX), potato virus Y potyvirus (PVY) and potato spindle tuber viroid (PSTVd). Aphids often cause the leaves of the plant to curl, lose colour or appear stunted.

Control method: Aphids are naturally controlled by parasitic wasps, ladybird beetles and lacewings among others. Intercropping cabbages with other crops such as spinach, beans and grasses can help in the control of aphids. Aphids can also be effectively controlled by extracts made from pyrethrum. Neem oil and neem seed extracts have also given effective control to the aphid species. Early detection and monitoring of initial aphid build-up is important. Spraying should only be done when the aphid population is heavy (e.g. hot spots

to keep the aphids from spreading), since the natural enemies especially parasitic wasps and ladybird beetles usually offer effective control.



Cabbage aphid (top), ant feeding on black aphids (below). (Photos courtesy: Infonet)



A little more care boosts potato yields

Compared to the demand potato production is too low. How can it be improved?

The Organic Farmer

In Kenya, potatoes are successfully grown at altitudes above 1500 m. They are tolerant to a wide variety of soils, except heavy, waterlogged clays. Good drainage is of great importance. Deep soils with good water retention and aeration offer best growth and yields.

Many farmers are complaining in letters to *TOF* about bacterial wilt, a devastating disease. When we ask them: Do you use the same site for planting potatoes? They say: Yes. This is very wrong. The selection of the right site is important: Potatoes should NOT be grown in an area where potatoes and other crops of the same family (tomatoes, capsicums, egg plant bananas etc.) have been grown in the previous year. They should wait for at least three or four seasons (about 2 years). This delay is necessary in reducing the level of soil infestation by diseases once the soil has been contaminated, and to avoid volunteers. (These are potatoes which grow on their own and which usually harbour various diseases and pests.)



Tigon



Asante



Dutch Robyjn



Roslin Tana

Maize and legumes are recommended for crop rotation practices. Brassicas (or crops in the vegetable family) such as cabbage, sukumawiki, spinach, and mustard plants are beneficial if planted before the potato crop. This will reduce incidence of bacterial wilt and nematodes.

Use disease free seeds

The lack of clean seeds remains a big problem (see page 1). Try by all means to get disease-free seed or certified seed tubers of about the size of a chicken egg. Sprouting tubers should be placed in indirect sunlight to obtain short and strong sprouts that will not break easily during planting.

Land preparation: The land should be ploughed at least 20 cm deep or dug by hands to a depth of 15 cm. The soil should be well broken to avoid large clods and to allow soil aeration, and it should be weed-free. In murrum and poorly drained soils potatoes do not perform well.

Fertilizer: Potatoes are heavy feeders. Plow-under or incorporate available compost or organic manures in the soil before planting. This enhances the water-holding capacity and provides enough nutrients for a healthy crop. Potatoes respond well to large amounts of compost or well decomposed animal manures. If you use fertilizer it is advised to ask for assistance from the local agriculturist office for soil sampling and soil analysis. In any case avoid direct contact of the tubers with the fertilizer as this may have a burning effect on the tubers.

Planting & Spacing: In regions with a critical dry season, planting early in the rainy season is best. If the rainy season is long and the rain excessive, it is advisable to plant towards the end of the rainy season. Planting potatoes during the period of excess rainfall exposes the crop to more diseases, which are very difficult to control. The spacing should be 75 cm between the rows. Tubers are placed in the furrows at a distance of 30 cm from each other with the side having more sprouts facing up. Potatoes are planted at a depth of 5-15 cm (measured from the top of the tuber). Shallow plantings should be avoided. Earthing-up or making hills (ridges) soon after emergence helps to control weeds, prevents greening of developing tubers as well as spores of late blight fungus and the tuber moth from reaching the tubers.

Weeding & Ridging: Weeds compete with the potato crop for moisture, light, nutrients and space, thereby reducing yields. Begin weeding after the potatoes have germinated to avoid uprooting the seed-tubers. Earth-up along the rows as the potatoes grow. The final ridge should be about 25 cm high (see illustration on page 6). Weeding should be repeated. Well covered tubers cannot be attacked by the tuber moth (see page 5). Do not work when the soil is too wet since you spread fungal diseases such as Late blight.

Variety*	Suitable growing areas	Strengths	Weaknesses
Tigon (30%) ↗	Kiambu, Nakuru, Uasin Gishu, Narok	High yielding, resistant to late blight, big tubers	Sensitive to bacterial wilt
Nyayo (25%) ↘	Nyandarua, Nakuru, Mbooni, Uasin Gishu, Narok, Nyeri, Machakos, Kathiani, Laikipia, Molo	Early maturing, tasty	Sensitive to late blight
Tana Kimande (7%) ↗	Nyandarua	Big tubers, good price	Low yields, late maturing
Asante, (6%) ↗	Meru, Mt Elgon, Nyeri, Mbooni, Ndeiya, Machakos, Laikipia, Taita Taveta	high yielding, resistant to late blight, big tubers	Not good for mashing
Dutch Robyjn (5%) ↗	Mt Elgon, Bomet	Storage, crisping	Sensitive to late blight
Kerr's Pink (3%) ↘	Meru	High price, early maturing, tasty	Sensitive to late blight
Roslin Tana (2%) ↘	Nyandarua, Nakuru	Good for chips	Low yields, sensitive to late blight

*Estimated area harvested in %; the arrows indicate the trend in the area, ↗ means increasing, ↘ means declining trend.

Source: Infonet

Continued on page 6

These terrible blights!

Fungal diseases such as Early blight (*Alternaria solani*) and Late blight (*Phytophthora infestans*) are the major problems in potato production. Early blight is favoured by cool, cloudy, wet conditions and is more severe when plants are stressed by poor nutrition, drought or nematode attacks. Late blight thrives best under warm and wet conditions.

Controlling blight once it has established itself on potato plants is very difficult. The most important way of controlling blight is attempting to prevent its establishment and further spread.

Prevention methods

- Use clean seed; if you can see lesions (wounds) on the seed tubers, don't use them for propagation.

- Use tolerant or resistant varieties (see table on page 4).

- Use plenty of compost or well decomposed animal manures. Nitrogen and phosphorus deficiency can increase susceptibility to Early blight.

- Destroy crop debris after harvest as these may be contaminated with disease causing pathogens.

- Crop rotation: Fields should not be planted with tomato, potato, or eggplant for at least 4 cropping seasons if Early or Late blight are present. Rotations with small grains, maize or legumes are preferable.

- Take care of tubers: Avoid injury to potato tubers during harvesting and handling

- Clean the tools to stop the disease from spreading

How to control Early blight

Botanicals

- Fermented Marigold extract: Fill-in drum with 1/2 - 3/4 full of flowering plants. Leave to stand for 5-10 days. Stir occasionally. Strain before use. Dilute the filtrate with water at a ratio of 1:2. Add 1 tablespoon of soap to every litre of the extract.

- Onion bulb extract: Finely chop 50 g of bulb onion, add to 1 litre distilled water, mix well, strain. Spray thoroughly on the infested plant, preferably early in the morning or late afternoon.

Fungicides

- Sulphur: Sulphur is permitted as preventive fungicide in organic farming. The commercial product 'Thiovit' has been reported by



some farmers to have preventive effect on Early blight.

- Copper: Most copper products are either based on copper oxychloride or copper hydroxide and are readily available in the market.

Also recommended is the Bordeaux mix which is a combination of copper sulphate and hydrated lime.

How to control Late blight



Botanicals

- Chop and mix Mexican marigold with water, nettle and *Plectranthus barbatus* (beautiful blue flowered shrub, commonly used for hedging and said to have particular fungicidal properties) (kikuyu name: *Maigoya*) to prevent outbreaks of late blight.

- It is also good to try EM1 or BM as they have preventive properties where other fungal diseases are concerned.

Fungicides

- Copper: (see *Early blight*).



Tuber moth is a threat

The potato tuber moth is the most dangerous potato pest in the region. Female moths lay eggs on sheltered places of the leaf and stems and near the eye buds on exposed tubers through cracks in the soil or in the store. The caterpillars drill into the tuber and make long irregular black tunnels which provide an entry point for various plant pathogens: Such potatoes become unfit for human consumption. The pest is transferred with the harvested tubers to the potato store, where it can reproduce and infest other tubers. This may lead to total destruction of the stored crop.

Preventive methods

- Use healthy, clean seed, since infested seed tubers are the main cause of re-infestation in the field.

- Avoid planting in rough soil.

- Plant as deeply as possible (10 cm deep) and ridge at least three times during the growing season. Compact hilling is very important to prevent moths from reaching the tubers to lay eggs.

- At harvest, ensure that the tubers are not exposed to moths before they are properly protected in the store.

- Destroy all infested potatoes immediately, remove all plant residues from the field and destroy all volunteer potato plants before planting new potato crops.

Take care of the "good guys"

Natural enemies such as ladybird and lacewing are important for natural control of the potato tuber moth, and several native parasitic wasps (e.g. *Dia-degma mollipla*, *Chelonus spp.*) attack this pest.

Protection

Use alternative natural pesticides to protect potatoes in store.

Lantana: Research done by the Central Potato Research Station, Shillong indicated that from all plants providing protection to the tubers, the leaves of *Lantana aculeata* were best, followed by *Eucalyptus globulus*.

Neem: Spray neem seed extracts and place the tubers in jute sacks.

Mpilipili: Tuber infestation can also be reduced by bedding the potatoes in the leaves of the Peruvian pepper tree (*Schinus molle*), also known as *mpilipili* in Swahili.

Diatomite: Application of plenty of diatomite earth prevents rapid build up of tuber

moth.





farmers forum

Name these feed companies

Your article on feeds (*TOF* April 2008) was quite an eye opener for farmers who buy poor quality animal feeds without knowing it. We incur huge losses as the so called feed manufacturers laugh all the way to the bank. However, your article does not solve farmers' problem because you do not give us the names of the companies selling the sub-standard feeds. It would really help farmers if you had included the names of the companies. This way, we would be able to know where to purchase quality feeds. John Mugambi P.O. Box 99 Meru

Dear Mr. Mugambi,
Thank you for your observation, the omission of the names of the companies from which we got the samples was deliberate



on our part. If we were to name the companies, no farmer would buy their products. They would then go to court seeking damages for loss of business. What we would advise farmers to do is to ensure they buy animal feeds from reputable and well known companies which sell quality feeds. Fortunately many farmers around you already know these companies and should be able to help you.

>>> from page 3: potato yield

Harvesting: When the leaves turn yellow, take about 10 - 20 plants at random and check whether the tubers are 35 - 45 mm in length. The stems should then be cut at ground level.



Ridging allows tubers to fill out and protects the tubers against the tuber moth

This activity (also called dehauling) enables the skin of the tubers to harden and it reduces the spread of viruses. Avoid injuring the tubers. Harvested tubers should be stored in well-ventilated crates and should not be exposed to direct sunlight but kept in the shade. Before storage, remove diseased, damaged or misshaped potatoes.

Five reasons for increasing food prices

Energy: High prices for oil and gas make the production, processing and transport of food more expensive.

Appetite: In China, India and other fast-developing countries with a high economic growth, eating habits change. The higher the demand for meat, the more grains are fed to animals. For the production of 100 calories of beef, for example, 700 calories of food are spend.

Urbanisation: Since cities are growing worldwide, the available farm land decreases, and the number of urban consumers is on the rise. According to the United Nations, by the end of 2008, for the first time in history more than half of the world's population will live in cities.

Biofuels: Industrial nations promote the production of biofuels to reduce their dependence on petroleum. Therefore, on more and more farms grows produce to be processed to fuel than food.

Weather: Hurricanes, floods and droughts are causes for crop failure or the fact that farmers are not able to farm their land. (TOF)

We require more copies

Congratulations for an informative magazine. It encourages the use of natural inputs which is very healthy for our current generation. Be kind enough to put us on your mailing list for the benefit of our members. Redeemed Gospel Church, P.O Box 1493, Kitale

Supporting rural development

I am a student at Egerton University Njoro pursuing a course in agricultural education and extension. I have over the last few years been reading your copies of *The Organic Farmer* and I am greatly impressed by its wonderful contribution to the agricultural development especially organic farming, which is a pillar and the key to attaining sustainable agriculture in our agriculture-based economy. I hereby request for a supply of a copy of the same so as to continue propagating the principals of organic farming both in education and extension. Once again I commend you and the entire team for the good work you are doing.

Julius Muteti, P.O Box 2748, Nakuru

Soil tests too expensive for farmers

Agricultural institutions should help farmers by taking soil samples to test in order to know the type of crop recommended. The soil laboratory tests are too expensive and even most farmers do not know about it.

Tel. 0720 063 460

I have learnt a lot

I am a field officer working for a Government parastatal in Nakuru and do interact with many farmers. Your magazine has taught me a lot and I usually share these with farmers. The only obstacle is that I get your magazine through someone who I have to keep on reminding every month. I am kindly requesting you to mail me directly so that I can distribute to farmers on my field trips. Please consider my request.

Antonina L. Keya, P.O Box 13104, Nakuru

Organic farming is the future

I have come across your magazine which I found very interesting. Considering the cost of farm inputs and most of their side effect both on us and our environment, I support you that the future is in organic farming. In my area, no one practises organic farming and I think it is the high time we started it. Can you kindly put us in your mailing list? Nelson M Maina, P.O Box 285, Karatina

Dear Farmers,

If you have any questions or ideas for articles, or if you would like us to publish experiences about your shamba or within your farmers' group, please contact us. We shall get back to you! SMS ONLY

Tuma maoni yako! Asante.



Fungus causes pumpkin rot

My pumpkins usually rot at maturity stage, what is the cause? Jonathan Omusikali, Tel. 0723 398 376

Jonathan, it sounds as though your pumpkins have anthracnose. At such a late stage it is almost impossible to save them. Anthracnose, caused by the fungus *Colletotrichum lagenarium*, is a devastating fungal disease. It causes defoliation and lesions on the fruits. Anthracnose disease attacks all parts of the plant at any stage of growth. The symptoms are most visible on leaves and ripe fruits.

Copper oxychloride can be used to control it, if it is detected early.



Anthracnose on a cucumber leaf

Strawberry seeds?

I would like to grow strawberry. Where can I get seeds? Wellington Njeru Tel. 0720 996 322

You can get strawberry runners from Mr Wilfred Ngure (Tel. 0723 260 233) and his group of strawberry growers in Tigoni. He has two types, Shadra and Pajero both originally from the U.S. Each runner costs KSh 25.00

A runner grows directly from the mother plant as opposed to a seedling that grows from seed. Strawberry propagation from seed is quite difficult. (SK)

Read and follow instructions on the label carefully. Monitor plants regularly and spray only when necessary as copper can accumulate in the soil. Spray in the early morning or late afternoon. Wear protective clothing when handling, and wash your hands after handling.

Field sanitation

As a future remedy, do not grow pumpkins or any of the same family group (melons, cucumbers, squash, butternut) in the affected field for at least two growing seasons.

Field sanitation is an important and highly effective farm practice to keep most pests under control.

- Properly select healthy plants for transplanting.
- Keep weeds under control at all times.
- Observe personal hygiene. Always bear in mind that you might be the carrier of the pests while you move from one plant to another
- Pull plants that are heavily infected with insect pests and those that are showing heavy symptoms of disease infection.
- Prune the plant parts where insect pests are found congregating and those that show heavy symptoms of disease infection.
- Properly dispose of all the infested plants. Do not put them on the compost pile.
- Pick rotten fruits and collect those that have dropped. Diseased and pest infested fruits must be properly disposed off. Do not dump them in the compost pile.
- If possible, remove all the crop residues after harvest. Add these to your compost pile, except if they are diseased or pest infected.
- Clean your farm tools.

Su Kahumbu/TOF

Questions? Go to Infonet!



Infonet is an information platform for organic farmers. Whatever you would like to know about the ecological methods for the control of pests and parasite infestations of plants, humans and animals – Infonet will have an answer. You just go to the Internet, either at home or at a cyber-cafe and type in:

www.infonet-biovision.org



Coffee disease problem

My coffee bushes are dying mysteriously, please advice. Tel. 0721 839 816

Unfortunately I do not have much experience with coffee. I would like to suggest the following. Before any action is taken, you must identify what is causing the problem. Is it a pest, or a disease? To do this you really need to inspect the plants, those that are dying as well as those that are dead. Check every part of the coffee bush, the berries, the leaves, the stem etc and note down any abnormalities. Uproot the dead tree and look beneath the roots. Take samples of the dead plant, including all the parts you found 'suspect' during your examination, to your nearest agricultural extension office. Please contact us and let us know what you did and what you discovered so that we may share this with other readers.

Su Kahumbu

Deformed water melons

How can I prevent deformation of melon fruits? Tel. 0727 731 647

Deformation in melons can either be attributed to insect damage or viral damage. It is good to know the cause. Viral damage would be evident in the leaves, they would show mixed colours, stunted and deformed. In this case the solution is to burn the entire plant. Do not grow the same family of crops in the same area for at least two growing seasons. Virus is spread via insects, so it is good to spray for insects too if your other plants in the same area are not affected.

If the leaves are healthy and the fruits deformed, it is probably insect damage. Spray the plants with a bio-pesticide (spray in the early morning or late afternoon). I recommend Flower DS which is pyrethrum-based, every second day for at least a week, then spray once a week with neem. Make sure to harvest all edible parts of the plant before spraying.

Su Kahumbu

from farmers for farmers

Fighting stemborer naturally

Apart from controlling the stemborer, the Push-pull method provides fodder and boosts soil fertility.

The Organic Farmer

Friday April 11 was a special day for members of Kihiga Women's Group of Kagunduini location of Thika District. Early in the morning, the women lined up along the road to welcome a Swiss delegation who were coming to visit a demonstration plot run by the group. Early this year, the women's group became one of the beneficiaries of a Push-pull project that is aimed at controlling the stemborer. The project is funded by BioVision, the Swiss-based foundation that also sponsors *The Organic Farmer* magazine. The project is jointly being implemented by KARI, ICIPE, *The Organic Farmer* and the Ministry of Agriculture.

Impressed by project

Kihiga Women Group is one of the most active in Kagunduini location. Started in 1999, the 26-member group has been engaged in a number of income generating activities. Through a revolving fund, they have built water tanks, managed to acquire dairy goats and ventured in poultry and rabbit keeping.

The group members took the BioVision delegation through their Push-pull demonstration plot, planted with neat rows of maize intercropped with beans and lines of desmodium legume. Around the edges of the plot was a healthy stand of Napier grass. The group has made very good utilisation of space to grow all the crops. "I am really impressed by the work of this group. We hope that this technology can spread faster within the region to help farmers maximise their yields", said Verena Albertin, the BioVision Projects Coordinator.

Apart from Kihiga Women group, the BioVision delegation also visited Mugari Self Help Group in Saba Saba Division of Maragua District which has also adopted the Push-pull technology.

What is Push-pull technology?

Push-pull is a simple method of controlling the stemborer. In this method, maize, beans and desmodium, a legume that is also a nutritious fodder, are planted in alternating rows. Napier grass is then



KARI supplies Desmodium and Napier grass seedlings to Kihiga group members planted around the three crops. The stemborer does not like desmodium smell, so the desmodium pushes it away from the maize. Since Napier is attractive to the female stemborer moths, it pulls the moths to lay their eggs on it.

But Napier grass does not allow stemborer larvae to develop on it. When the stemborer eggs hatch and their larvae enter the Napier grass stem, the plant produces a sticky substance like glue which traps them and they die. So very few stemborer larvae survive and the maize is saved. The Push-pull method has been shown to increase maize yields by between 25 and 30 percent in areas where the stemborer is a problem.

More farmers will benefit

The push-pull project is being implemented in three Central Province districts of Maragua, Muranga and Kirinyaga. The training of farmers groups is being done through participatory practical lessons through the Farmer Field School (FFS) concept. The project has trained 6 Farmer Field Schools in the three districts. Each of the Farmers Field School is expected to train about 100 other farmers in their locality, in the end benefitting more than 600 farmers throughout the project area. Samuel Njihia, a researcher from KARI Muguga is heading the training team composed of researchers from KARI and the Ministry of Agriculture. *The Organic Farmer* will help in dissemination of information on the results of the project including lessons learnt to other farmers in the country.



Market Place

Training: Jomo Kenyatta University of Agriculture and Technology has a training programme for farmers who want to go into mushroom growing as a business. 2008 training dates May 21-23, June 18-20, July 23-25, Aug 27-29, Sept 17-19, Oct 22-24, Nov 12-14, Dec.3-5. Course charges are Ksh 10,000 per participant. Call now for booking at; JKUAT Enterprises Ltd. 067-52420. 0736-524200. 0724-256696.

e-mail:md@jkuates.jkuat.ac.ke, bm@jkuates.jkuat.ac.ke Ask for P.K.Muchiri.

Training: Baraka Agricultural College is offering the following short courses on sustainable agriculture for interested farmers: ICT for rural development May 4-10, Introduction to beekeeping May 4-10, Poultry production May 11-17, Sustainable agriculture May 18-24, Introduction to beekeeping May 25-31, Mushroom-growing June 8-14, Small-scale food processing June 15-21, Bee multiplication and breeding June 22-28. Participatory Action Research July 6-12, Animal health July 13-19, Sustainable livelihood approaches July 27- August 2, August 3-9, Vegetable production August 10-16, Bee equipment making August 17-23, Training of trainers August 24-30, Fruit production August 31-September 6. Farmers interested in pursuing these courses can contact the college at the following address: The Principal Baraka Agricultural College P.O. 52 Molo, Tel. 051 721 091, Tel 0725 777 421. email:baraka@sustainableag.org

Amaranth seeds wanted: I need amaranth seeds. If you have any for sale please call Roslin Tel. 0734 994 111

Turkey chicks: I need turkey chicks. If you have any for sale please call Tel.0721 155 169.

Tree tomato seeds: I need to buy tree tomato seeds. Please call Emmanuel Sirengo Tel. 0729 750 707.

Lettuce for sale: I have organic lettuce for sale. Interested buyers can call me on Tel. 0735 651 639.

Dairy goats for sale: I have 5 female dairy goats and 1 male for sale. Interested farmers can call Tabitha Tel. 0725 72 42 39, Ruai.