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HortiNews

Growing Ideas

ISSUE NO. 59 KSH 300

FloraLife®
Experts in Flower Care

Control the disease that most affects flower loss at the store level. Have better quality and better profits.

Floralife® TransportPAPER controls the spread of plant pathogens, such as Botrytis cinerea, which commonly destroy flowers. The host preferences of this fungus include virtually every plant grown in a greenhouse or field, produced for both cut flowers and potted plants. It is used during the transport of flowers in shipping boxes from the field grower to the buyer, bouquet maker, or greenhouse, to the retail store level.

Be proactive and start using Floralife® TransportPAPER in your floral shipments for happier customers, increased profits, and less waste.

'Akito Rose'—Control without treatment

'Akito Rose' with Floralife® TransportPAPER

Floralife® TransportPAPER to Lessen the Number One Flower Disease

Gray mold (Botrytis cinerea), is a serious, widespread plant disease on harvested floral crops. Infected fresh cut flowers not only look bad and can produce more harmful ethylene, but it causes premature death. Poor quality flowers result in dissatisfied consumers and lower profits due to higher postharvest losses for participants involved in the flower chain process.

Unfortunately, there is little that can be done to control this disease at the retail level other than storing flowers at their proper temperatures and keeping the flowers and foliage dry to slow down the disease. To improve flower quality, it is therefore necessary to control the disease early on in the postharvest processing process by the grower shipper.

Floralife® TransportPAPER is a postharvest waxed tissue specially designed and formulated for the intended use of slowing the premature spread of plant pathogen spores, such as Botrytis cinerea, on flowers and foliage. The host preferences of this fungus include virtually every plant grown in a greenhouse or field production. It is for use during the transport of flowers in shipping boxes globally and effective in both refrigerated and non-temperature controlled shipments.

Growers can recognize Botrytis cinerea by the coating of grayish brown mold that forms on dead tissue when it sporulates. Wounded or older tissues and flower parts are very susceptible.

Some of the crops especially prone to Grey mold, or Botrytis blight, are rose, carnations, snapdragon, lisianthus, gerbera, dahlia, zinnia, anemone, geranium, exacum, primula, bacopa, fushia, cyclamen, poinsettias, and vinca. This disease can easily spread from one flower to the other, damaging the entire crop.

Floralife® TransportPAPER is impregnated with chlorine dioxide releasing compounds and reacts when exposed to relative humidity above 40%. Floral shipping boxes are good environments high in moisture for the growth of pathogens. Floralife® TransportPAPER is a simple and easy product to utilize in flower shipping cartons.

Gray mold disease on roses

A number of grower experiments have been conducted to evaluate the effectiveness of Floralife® TransportPAPER. Photographs below show the appearance of flowers with and without the treatment at postharvest evaluation stage. The control flowers (no treatment) showed definite signs of Botrytis infection, whereas flowers treated with Floralife® TransportPAPER did not show early signs after seven days. Growers should strongly consider using Floralife® TransportPAPER in the flower shipping cartons/boxes as a preventative tool to reduce the chances of Botrytis spreading to healthy flowers, thus improving overall flower quality. A small investment per box of flowers should result in very high returns on the investment.

Control – Untreated flowers

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For further information or to purchase Floralife® TransportPAPER , contact Floralife® Africa at +254 780 000073 /+254 733 123 006 www.floralife.com

Botrytis – The most damaging floral disease facing flower growers and beyond

By JOHN KIHIA AND SHARON MIKULINSKI

Botrytis is considered one of the biggest blights in the floral industry, especially post-harvest where it survives easily, even in the cold, moist conditions of a flower cooler. Often referred to as gray mold, this fungus produces brown spots that are often followed by abundant fuzzy gray structures that produce spores on the surfaces of infected tissues. These spots grow in size and result in soft, mushy flowers that are often unsellable, and cause significant loss to those in the business. Flowers often show no symptoms when they are packed at the farm, but the disease develops during the shipping process, leaving the recipients of the flowers very unhappy.

The floral industry is losing more money as a result of Botrytis than any other foliar or flower disease. Growers struggle to control and manage this fungal disease and spend a lot of money for measures that are likely ineffective.

With Botrytis, it is easy for growers to become overconfident that all control measures are working until the wet season begins. Then, nothing seems to work. And, there is no silver bullet, such as a new generation of fungicide, that will suddenly make the problem go away.

The future of Botrytis control is going to require an integrated approach to control and manage – reduced pesticide applications, improved sanitation, modified cultural practices, and use of biological control agents. So, let's talk about this damaging disease.

What is Botrytis and how does it damage flowers?

Botrytis is a fungus that lives on living and dead plant tissue. The fungus grows rapidly and once the disease reaches the stage where the spores are present, they are spread very easily by water and air.

Botrytis spores will survive in production greenhouses and outdoors for about a year. Once the environmental conditions are good for germination, the spores quickly grow and attack petals, leaves and stems. As leaves or any other plant parts fall from the plant, the residue is a home for the fungus. Multiple life cycles can be generated on stems and in plant residue, thus increasing the number of spores rapidly. All these spores can be spread to flowers.

Botrytis spores germinate and grow tubes that puncture the petals or leaf surfaces and as they enter the cells, they emit a toxic substance that kills the internal tissue in the leaves and petals. This damage and growth results in the browning injury seen when Botrytis is present. And, once the damage took place there is no way to reduce growth of the fungus – the damage is done, and it just continues to expand and kill more of the petals and leaves.

Why is Botrytis so difficult to control?

There are many reasons why Botrytis is such a difficult disease for growers.

First, it has such a strong ability to survive under adverse conditions – often the presence of Botrytis is not recognized when conditions are not

good for growth. This is just a good natural survival mechanism.

Second, cultural practices may promote growth and/or survival.

Third, the environmental conditions for production of most flowers are the ideal conditions for Botrytis growth. Oh, and shipping conditions can provide a basic incubation chamber for Botrytis to grow.

Fourth, Botrytis, for the most part, may be resistant to the fungicides available to growers today whether they are used as sprays or dips.

Environmental Conditions for Botrytis Growth?

As mentioned above, the ideal production conditions are also the best conditions for Botrytis growth.

Botrytis will grow at any temperature from 2C (35 F) to 32+C (90+F). But, the most rapid growth is between 18 – 27C (65 – 80 F).

Then, one must add humidity. Moist production conditions are perfect for Botrytis growth as it is for plant growth. One belief is that Botrytis requires moisture to grow. Not True! Yes, when water is present, and the temperature is in the optimal range, spores will germinate in 4 hours. But, under conditions where the humidity is above 93%, spores will germinate in 8 hours.

Growers cannot really modify temperatures without affecting flower production. Humidity can, to some extent, control Botrytis.

Proper Sanitation – An Absolute Necessity for Botrytis to be Controlled!

Any dead or dying plant material within the plant canopy or on the floor can be a location for growth of Botrytis (and probably is promoting growth.). These sources of Botrytis must be carefully removed EVERY DAY).

Dead and decaying leaves must be removed carefully and gently. Aggressive raking or use of leaf blowers stirs the air as well as Botrytis spores which will most likely land on the plant canopy ready to grow.

Plant Nutrition

Some new and innovative nutritional programs are being evaluated to reduce the growth of Botrytis in the U.S., with on-site trials in Colombia and Canada (funded by the American Floral Endowment). At this time, the research requires additional trials before specific recommendations can be made.

So, what can you do to limit Botrytis damage?

1. **Be Clean** – avoid the spread of Botrytis due to poorly managed practices such as leaving plant residue in the production area. Remove all residue daily.
2. **Watering Practices** – Watering late in the day raises the humidity all night. Do not water after 2 pm daily.
3. **Grow resistant varieties** – this is never easy because customers have "favorites" and therefore, they must be grown. Search for roses with similar colors that offer greater Botrytis resistance.
4. **Hydrate Flowers Properly** so they are not under stress during storage and shipping.
5. **Do not put sleeves on wet flowers**. The humidity level in these sleeves will promote Botrytis growth.
6. **Do not pack flowers with wet leaves, stems or flowers**. Remove flowers from hydration solutions and let them sit dry for an hour before packing.
7. **Maintain consistent storage and shipping temperatures.** Temperature fluctuations result in condensation in the sleeves and the presence of high humidity and moisture both of which must be avoided if Botrytis is to be controlled.

John Kihia is the Technical Manager Floralife® Africa and Sharon Mikulinski is the Global Marketing Director

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HortiNews
Growing Ideas

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The coordination of industry actors is expected to reduce duplication of roles while creating synergies and eventually translate into faster development of the horticulture subsector.

Industry Technical Working Group a great idea

As we were going to press, reports reached us that the Department of Horticulture in the Ministry of Agriculture, Livestock and Fisheries has formed a National Horticulture Transformation Technical Working Group composed of experts in the horticulture industry meant to create harmony and fill the gaps at national, to counties and all the way down to ward levels.

The working group has been broken down further into nine sub-committees with some being responsible for ensuring food safety standards in the country are maintained. This comes at a time there have been incidences of non-communicable diseases associated with consumption of contaminated foods by pathogens and pesticides residues.

Speaking to Hortinews during a visit at his office in Kilimo House, Mr. Joshua Oluyali, the Head of Horticulture Division in the ministry says the group will help in coordination of the industry for seamless flow of information and facilitate the private sector to know what the government is putting in place to spur development in the sector.

The coordination of industry actors is expected to reduce duplication of roles while creating synergies and eventually translate into faster development of the horticulture sub-sector.

We, like other stakeholders in this industry welcome this step despite coming quite late in the day for a sector that is fairly stable largely due to its being private sector-driven. If indeed Mr Oluyai succeeds where many efforts have failed to deliver on centralizing information sharing for the sector, it will not only be a milestone but also herald a brighter future as critical gaps will be sealed. The experts in the working group will be identifying challenges facing the industry and suggest solutions.

The nation will be watching what the sub-committee responsible for food safety will recommend considering there are no checks on locally consumed fresh produce unlike the strict enforcement of rules and regulations on exports by the Kenya Plant Health Inspectorate Service. Mr Oluyali insists going forward locally sold produce must be tested and certified as safe for human consumption with clear policies on handling and application of pesticides.

This will be achieved by introducing of spray teams that are trained on scouting of pests and diseases, application of different pesticides and pre-harvest interval periods.

The technical team seeks to introduce basics such as the right skills, equipment, and early warning monitoring for outbreak of pests and diseases. Already, some 800 spray teams working in farms under USAid funded pilot programme are in 12 counties to lay the foundation on which the system will be scaled up to cover the entire country.

To mop up excess chemicals exposure, the ministry will facilitate establishment of stores for safe custody of pesticides and spray equipment.

HortiNews, a player in the National Horticulture Transformation Working Group will keep tabs on this development and keep both the sector, the nation and the global community informed on the status of the road towards a better coordinated sector and creation of a safe food supply chain.

We wish the team all the best in realization of a long awaited policy.

Catherine Riungu, catherine@hortinews.co.ke

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Oserian Development Company Finance Director Tim Ndikwe and Maxim Agri General Manager Mohamed Salman signed the agreement welcoming the agribusiness firm to the Two Lakes Industrial Park in Naivasha.

Lepidopteran pest (caterpillars) in flowers

Caterpillars are seasonal pests to the flowers but when in season they result in major losses to the flower industry as one caterpillar can cause damage to more than one flower

By DORIS KINYUA

Lepidopteran pests are chewing insect pests that cause damage mainly to leaves and petals making the flowers less Aesthetic and reduce their value. Caterpillars are the larval feeding and the most damaging/destructive stage of butterflies and moths from the insect order Lepidoptera.

Caterpillars are seasonal pests to the flowers but when in season they result in major losses to the flower industry as one caterpillar can cause damage to more than one flower. In flowers there are different kinds of caterpillar species which include Helicoverpa armigera (Boll worms) and Spodoptera exigua and thus it's important to know the exact pest that one has in their crop and out of these two, the helicoverpa species is the notorious and listed as a notifiable pest in the European market.

Description

Helicoverpa armigera commonly known as African bollworm is the main caterpillar that infests flowers in green houses and outdoor ones. The are a pest of roses, carnations, hypericum, gypsophilla amongst other flowers. It is unique in that the moth lays its eggs singly on the roses and specifically on the softest parts of the crop. In roses the eggs are found on the flower buds and petals.

Temperature is the main force behind the speed of a life cycle. The hotter it is the faster the lifecycle. The eggs are small, yellowish-white, ribbed and rather dome shaped. The egg period is two days after which it hatches to a larva- the caterpillar.

The caterpillar eats the eggshell to emerge after which it bolls making circular holes through the petals only to feed from inside the flower. There are 6 instars or stages of the caterpillar in a larval period of 16 days and the damage to the crop increases with increase in size of the caterpillar. These caterpillars are cannibalistic. As the larvae size increases ,its becomes difficult to control .

When a caterpillar matures it drops into the soil or the growth media to pupate. The pupa is shiny brown; about 16mm long with smooth surface and with two short parallel spines at the posterior tip of the body and the pupal period is 10 days at normal temperatures. The pupa is dormant and doesn't feed.

When it rains the pupa emerges into an adult called moth with the male moths being greenish in color and females being brownish..The moths are nocturnal and thus not easily seen unless one has a trapping system like pheromone traps specifically for the helicoverpa or light traps or water traps. one female moth can lay around 3000 eggs in a lifespan of 10 days and thus one moth can cause an economically reputable damage to one greenhouse. These moths lay eggs closely soon after the rains start and thus its important to have an alert scouting system.

Control Strategy

To successfully control this pest, an holistic approach is recommended and below points are Key.

- Scout the field thoroughly.
- Hit when the Caterpillar/Larvae size is small.
- Alternate modes of action of the chemical control options.
- Adapt an IPM approach in management of the pest.

Integrated control methods for this pest are as follows.

1. Cultural Control-Use of pheromone Traps, Planting trap crops, use of Repellant sprays(Plant extracts).
2. Biological Control-Use of Bacillus Thuringiensis strain Kurstaki and Aizawai
3. Chemical Control-Use of Spinosyns (Delegate and Tracer),Methoxyfenozide(Runner)-IGR ,Indoxacarb etc.

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Pest Alert: False Codling Moth (FCM) in Ornamentals in Kenya

False codling moth is a multivoltine pest which does not enter diapause leading to year-round overlapping generations on host plants

By Victor Juma, Business Manager, East Africa lawn and Garden

The cut flower industry, one of Kenya's most important sectors, earns the country around $0.5 billion annually. Production of cut flowers is, however, constrained by insect pests and diseasesamong other factors resulting in yield loss and poor quality produce.Of the pest challenges currently facing flower producers in Kenya is the false codling moth (FCM), Thaumatotibia leucotreta, which is categorized as a quarantine pest by the European and Mediterranean Plant Protection Organization (EPPO). Growers have suffered financial losses due to quarantine restrictions imposed on exporting countries and detection of a single larva can result in rejection of an entire consignment.

False codling moth is native to sub-Saharan Africa and is a pest of economic importance to many crops. It is a key pest of citrus, pepper, avocado,macadamias,and cotton. Previously, there were no known reports of FCM being a pest of roses until its larvae was detected several times by the National Plant Protection Organization of the Netherlands (NPPO) in buds of Rosa cut flowers originating from countries where the pest is present. Different studies and trials conducted in Kenya by several researchers has shown that FCM is widespread across the country with Kirinyaga, Murang'a, parts of Kiambu and Nakuru, Machakos and Kajiado counties recording high prevalence rates.

False codling moth is native to sub-Saharan Africa and is a pest of economic importance to many crops

False codling moth is a multivoltine pest which does not enter diapause leading to year-round overlapping generations on host plants. FCM has 2-5 generations annually in natural conditions. The life cycle of the false codling moth includes egg, 5 larval instars, pupa and adult. The completelife cycle takes between 30to 174 days depending on environmental factors such as temperature, humidity, food availability and quality and photoperiod, with 25°C being optimum.

PEST ALERT

FALSE CODLING MOTH (FCM)

One of the pest challenges currently facing flower producers in Kenya is the false codling moth (FCM), *Thaumatotibia leucotreta*. Growers have suffered financial losses due to quarantine restrictions and detection of a single larva can result in rejection of an entire consignment.

For proper control of FCM, it is desirable to use the yellow delta traps baited with a pheromone lure to monitor the extent and densities of this invasive moth pest. Visual inspection of plants involves looking out for signs of poor growth or rot; holes in flowers; adults hidden in foliage; and crawling larvae. Once the flower is damaged, it becomes vulnerable to fungal organisms that causes rots. Infestations can be identified by the brown spots and dark brown frass.

Current control of FCM in ornamentals consists of chemical application with Karate Zeon and Match, mating disruption using pheromones and biological control methods.

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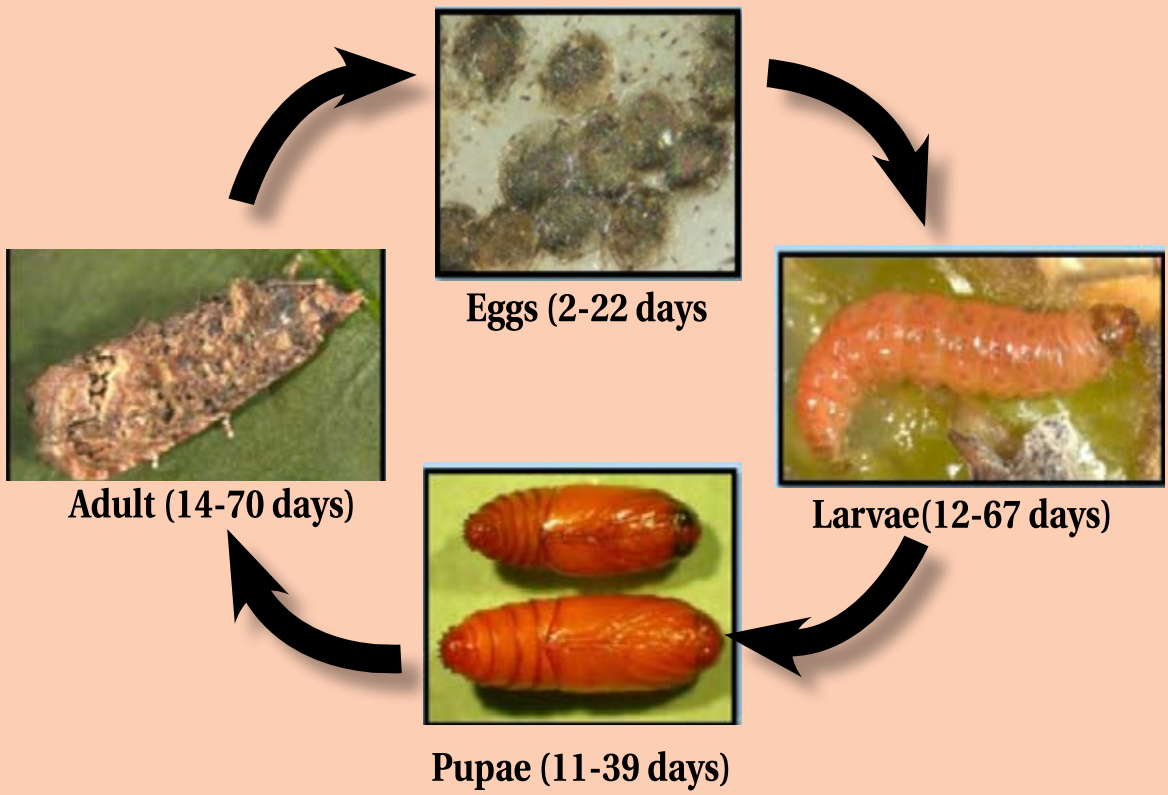

Mated female moths fly at night, depositing eggs singly or in bunches on flower buds. At an optimum temperature of 25°C, females can lay three to eight eggs per flower bud and up to 800 over her life span. The hatched larvae penetrate making burrows about 1 mm in diameter and feed inside the flower bud. Mature larvae exit the flower bud, then drop to the ground on silken threadsto pupate in the soil or within plantdebris. After a few days, the pre-pupae turn into pupae, remaining as such in the soil till they emerge as adult moths.

FCM larvae are difficult to detect once they are inside the flower bud, and the singly laid eggs are difficult to detect as well. Thus, it is desirable to use the yellow delta traps baited with a pheromone lure to monitor the extent and densities of this invasive moth pest. Visual inspection of plants involves looking out for signs of poor growth or rot; holes in flowers; adults hidden in foliage; and crawling larvae.Once the flower is damaged, it becomes vulnerable to fungal organisms that causes rots. Infestations can be identified by the brown spots and dark brown frass.

CurrentcontrolofFCMin ornamentals consists of chemical application, mating disruption using pheromones and biological control methods, although cultural control practices including field sanitation, removal and destruction of infested flower buds remains an important foundation for all FCM control options. Additionally, the level of control achieved is therefore the sum of the efficacy of all the measures used, denoting that even if efficacy with a single measure is sub-optimal, when several measures are used in combination through the course of one season, levels of FCM control may well exceed 95%. ❐

FCM larvae are difficult to detect once they are inside the flower bud, and the singly laid eggs are difficult to detect as well

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We started conducting small trials at the first phase which was successful prompting us to go to second phase of semi-commercial trials and eventually graduated to commercial trials pertaining sending aircraft pallets to Rose connect in Holland

Completed air pallets with cartons neatly arranged in layers. The black frames form a supporting system that diverts the load from the carton walls to the frames.

By MURIMI GITARI

The packaging technology better known as CARGOLITE™ a new concept in flower packaging has immensely penetrated the Kenyan flower industry and now introducing the concept to the Ethiopian growers.

Martin Kabaka, Cargolite™ Sales and Marketing Manager in Kenya has witnessed the introduction and the growth of the concept in Kenya and its implementation in the flower industry. It was first introduced to the Oserian Development Company Ltd by Amnon Zamir, Cargolite™ R&D Manager and by the CEO of Cargolite™ John Kowarsky. Martin was then working as a project manager for Oserian.

"We were able to identify Cargolite™ compatibility with customer specification and packhouse operation and it is at this point that Chris Lindley, the then operations manager approved trials. We started conducting small trials in the first phase which were successful prompting us to go to the second phase of semi-commercial trials and eventually graduated to commercial trials pertaining sending aircraft pallets to Rose connect in Holland," Mr. Kabaka says.

Several aircraft pallets were also sent to International Procurement Logistics (IPL) in UK from Oserian and later IPL adopted the concept. Numerous farms like Karen Roses, Branan Flowers and Shalimar Flowers adopted the use of the new packaging concept.

Oserian became the first farm in the world to use Cargolite™ technology commercially which later spread to other farms. IPL is the first buyer in the world to adopt the concept and later other buyers "have joined the club".

"The concept fell into good and very safe hands at Oserian, a flower farm that pioneers technology in the horticulture industry and shared the same with other farms unconditionally." Mr. Kabaka adds.

Further trials were conducted with Superflora a buyer in UK who later adopted the concept and as a result Karen Roses and Simbi Roses came on board.

The flower farms and buyers adopted Cargolite™ concept to resolve issues

revolving around high freight costs due to the adoption of the volumetric calculation by forwarders and also the ever-increasing packaging costs. An increase in pack rates of flowers is realized because no SFK's are used thereby creating more space for flowers, leading to better weights and consequently a reduction of freight and packaging cost as compared to other boxes. Palletizing the cartons at source minimizes the number of times each carton is handled, enabling the Cargolite™ concept to derive these savings for the flower industry.

Consequently, Primarosa Flowers, Winchester Farm, Maji Mazuri Farm, Molo River Roses, Waridi Farm, Finlay Flowers and Eco Roses are now packing using the concept

Oserian became the first farm in the world to use Cargolite technology commercially which later spread to other farms. IPL is the first buyer in the world to adopt the concept and later other buyers joined the club

"The farms and buyers save on packaging cost emanating from packing without SFK and the use of less boxes compared to standard boxes. Extra freight cost caused by the introduction of volumetric weights calculation have also been instrumental in Cargolite's™ success." Martin explains.

Recently a Norwegian buyer; Mester Gronn adopted Cargolite™ technology after successful trials with Penta Flowers that is now using Cargolite™ technology. Consequently, Primarosa Flowers, Winchester Farm, Maji Mazuri Farm, Molo River Roses, Waridi Farm, Finlay Flowers and Eco Roses are now packing using the concept.

Early this year, Cargolite™ partnered with ACME Containers Ltd a plastic products manufacturer in Kenya. ACME played the role of making the plastic frames, distributing Cargolite™ accessories, marketing Cargolite™ concept and offering technical support to farms using the packaging concept in the country and in East Africa. However, the partnership ended in July, due to the very sad passing away of the owner, Mr Mukesh Shah. Mr Shah, a man with incredible foresight, believed wholeheartedly in the Cargolite project! The passing away forced Cargolite™ to operate on its own, trading under the daughter company, Njotland Marketing and Export Company Ltd.

Plastic frames are still being manufactured by Acme and recently Acme developed a lightweight plastic pallet for Cargolite™ concept that is in the trial phase now. The pallet weighs 50 percent less than wooden pallet thus saving on freight costs.

The carton manufactures in Kenya play a key role in Cargolite™ concept. The Cargolite™ cartons are being produced by many corrugated box manufacturers in Kenya. The farms and buyers are at liberty to choose the manufacturer they want to buy from. Then Cargolite™ Technical Manager submits the design and liaise with manufacturers to ensure that the box is made to specification

Freight forwarders were not left behind re the handling of Cargolite™. Panalpina, Kuehne Nagel, Morgan Cargo are handling Cargolite™ shipments successfully. Other forwarders can handle the packaging concept as well, further undergoing a short training period.

Having had talks with the Ethiopian Airlines Cargo Department to introduce the concept in Ethiopia, Cargolite™ conducted trials in the last quarter of last year. Commercial trials are underway during the third quarter of this year. Around 20 air-craft pallets will be airlifted from Ethiopia to Europe.

This packaging technology was developed in Israel but tried and developed in Kenya as the country is one of the biggest producers of flowers in the world. It has so far gained ground since its inception in the country 5 years ago and has become a major contributor to reduce the carbon footprint. Enabling exporters and growers to contribute, as well, to the very important environmental and sustainability aspects of the flower industry.

Long live Cargolite™

Our exciting 'Big Five' colours

'Big Five' colour mixes, special shapes, bi-colours, Kangaroo Paw & Hydrangea lines

De Ruiter the leading rose breeder from The Netherlands will once again welcome all guests to its stand at the Naivasha Horticultural Fair 2019 on the 20th & 21st September. Our team will be on hand to discuss our exciting 'Big Five' colour mixes, special shapes, bi-colours, Kangaroo Paw & Hydrangea lines.

This year our breeding, commercial & marketing teams have been hard at work to present new & refreshing varieties with revamped selections. Our unique marketing concept of 'The BIG Five' colour lines, Red, White, Orange, Yellow & Pink each represented by one of the African big five animals, Lion, Elephant, Leopard, Rhino & Buffalo has been carefully considered for the industry trade shows to bring a clean & refreshing line up for this years fair in Naivasha.

In The Big Five Reds we have introduced two varieties; Furiosa® & Born Free® our exciting, highly producing varieties in the retail segment. Furiosa® has been proven to be resiliant against certain deseases namely Agro-bacterium & Born Free® has been proven as a low altitude retail variety & also grown successfully at altitude in South America to achieve impressive budsize & production figures.

In The Big Five Whites we have introduced two new varieties in 2019; Epic White® with a vibrant white colour & impressive 200+ production figures. Bright Light® newely named in May 2019 this variety boasts a vibrant colour & good vase life.

In The Big Five Oranges we have introduced two alternative varieties from last year; Wannahave® a vibrant coloured, highly productive rose which can be grown in high or low climates. Orange Crush® has been selected for her slightly longer stem & highly productive character for the retail segment.

We have revamped our 'New Big Five' Pink colour mix by including our proven and successful variety Celeb®.

In 'Yellow' we have introduced Lavida® a highly productive yellow whom boasts 270 stems/m2.

Our Kangaroo Paw line; Early Spring®, Gold Fever® & Golden Gem® & Hydrangea varieties will give our range a unique diversity throught a wide spectrum of the markets.

The De Ruiter team are looking forward to welcoming its shareholders to its stand to discuss 'Creating Flower Business' and wish everyone a successful 2019 fair.

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Kenya's GlOBALG.A.P Tour Stop 2019

GLOBALG.A.P. is the most widely used on farm food safety system worldwide in the fresh produce supply chain. There has been an increase in demand by small and mid-scale producers wanting to know the relevance of the GLOBALG.A.P. system for International ,regional and local markets. Compliance to Good Agricultural Practices

By ANTHONY MUTAI

GLOBALG.A.P has partnered with Rootooba Limited (www.rootooba.com) to organize a GlOBALG.A.P. Tour Stop in the country. The event is themed as " Adding Value to Your Agribusiness with the leading Worldwide Standard for Food Safety and Sustainability."

This will be happening on 30th October -1 November 2019 at Kenya Agricultural & Livestock Research Organization(KARLO) headquarters, Kaptagat Rd, Loresho.The event offers a great opportunity to learn and network with important stakeholders in order to provide the tools necessary for growth.

GLOBALG.A.P. is the most widely used on farm food safety system worldwide in the fresh produce supply chain. There has been an increase in demand by small and mid-scale producers wanting to know the relevance of the GLOBALG.A.P. system for International ,regional and local markets. Compliance to Good Agricultural Practices (GAP) has become a requirement for access to; not only international markets but also regional and domestic markets which are increasingly focusing on utilizing safety standards.

Small and medium scale producers who need to access and maintain these markets require to comply with Good Agricultural Practices requirements at the minimum. Producers of fresh fruits and vegetables, avocados, herbs, spices, macadamia,grains , tubers, coffee and tea in the East African region who want to improve their farm operations , safety ,quality,and traceability need Good Agricultural Practices exposure more.

Come and interact with various stakeholders that will add value to your enterprise! They include GLOBALG.A.P. staff who are the custodians of the GLOBALG.A.P standard, producers, input suppliers, farmer assurers, certification bodies, testing bodies, logistical supply chain actors, exporters, local and international retailers ,development partners, and policy makers.

To our farmers, do remember to carry samples of any crop disease/pest that you seek solutions for. Interact with a dynamic group of plant doctors and engage with solution providers in the same place!

GLOBALG.A.P calls on those relevant to this sector, to attend the 2 day interaction event and optional farm visits to GLOBALGAP compliant enterprises on the third day.

Registration and attendance is free! To enable us take care of you during the event period, please send a confirmation on the following email : tourstopkenya2019@rootooba.com and provide your full name, company (if affiliated to one) title, email and telephone contacts. Alternatively, call the numbers provided below and provide the same information. Feel free to request for exhibition details should you wish to share your activities with the diverse audience.

Contact details for inquiries on the event: + 254 717 782 782 / + 254 734 782 782 or email tourstopkenya2019@rootoba.com.

THE GLOBALG.A.P. FLOWERS & ORNAMENTALS STANDARD

THE STANDARD BEHIND THE GGN LOGO

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1. Download the relevant GLOBALG.A.P. Standard Documents and Checklists from our document center.
2. Compare offers from the certification bodies in your country, register with the one you choose and get your GLOBALG.A.P. Number (GGN). Find a full list of GLOBALG.A.P. approved certification bodies on our website.
3. Carry out a self-assessment using the checklist and correct all the points you don't comply with. Here a GLOBALG.A.P. Licensed Farm Assurer, who is a trained and approved consultant, can provide you with valuable assistance during your audit preparations. Find a full list of GLOBALG.A.P. Licensed Farm Assurers on our website.
4. Arrange an appointment with your GLOBALG.A.P. approved certification body. An inspector will then conduct the first on-site inspection.
5. Once you successfully comply with the standard's requirements, you will receive a GLOBALG.A.P. Integrated Farm Assurance Standard certificate for the relevant version and scope which is valid for one year.

Find all required links on www.globalgap.org/certification.

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Importance of post- harvest water quality

Sally Share (right) of Flower Watch and Ruth Vaughan, Technical Director at Cropnuts training flower growers during a post harvest technology and water quality training at The Pot Hotel in Naivasha

By NDIRITU NJORA

Over 60% of quality can be lost post-harvest if flowers are not handled correctly. This is according to a presentation given by Ruth Vaughn, Technical Director at CropNuts, during a training organized by Flower Watch and CropNuts in Naivasha. The training sought to educate farmers on post-harvest technology, post-harvest water quality and its importance. There are various aspects that affect the quality of the plant post-harvest including the source of water used and the quality of the water. The quality of water in a stem affects such things as the speed of rehydration of a flower, its ability to maintain turgidity, blockage of the xylem and infection of diseases. The Kenya Flower Council takes into account three factors in its audit of its farms water sources; the availability, susceptibility to pollution and the frequency of water analysis.

Borehole water for example is of stable quality and has a low bacterial load. This water source however being from the ground may have high fluoride and heavy metals. Farmers using this source of water are required to test it annually. Availability of surface water however, varies seasonally and has a high bacteria load. This requires the farmers to test the water quarterly or more often. Rain water on the other hand is not always available and has low salts and a low pH. The bacterial load in rain water varies and its quality depends on the storage and collection methods used by the farm and it is recommended to be tested quarterly at a minimum.

Total bacterial count (TBC) refers to the number of bacteria in the water used, High bacterial count means that the bacteria present will move up the xylem and block it. These bacteria feed on the sugars in the stems and breed inside them. This reduces water uptake and vase life and produces plant toxins. Total suspended solids in water refers to the organic materials and matter in water. When waster has high total suspended solids, they block the xylem and affect the turbidity of the cells and promotes bacterial growth. To solve this issue the water should be filtered of flocculated using additives like aluminum sulphate which binds with particles in the water making them heavier and causing them to sink and leave behind clean water.

Post- harvest water uptake can also be prevented when the plant experiences a high percentage of dehydration. Typically, roses can recover from over 8% dehydration. However, dehydration above 12% leads to irreversible damage. Embolisms, which are air bubbles that form in the xylem that prevents water uptake to the plant. These air bubbles can be prevented by using cold water because it carries more air which enables it to dissolve the air bubbles it meets in the xylem and help in water uptake. However, since cooling of water in the cold store uses a lot of electricity and the water will not remain cold until it gets to the field, farmers are advised to keep it as cool as possible.

Specially aimed at Rose-flower producing companies

CROPNUTS
grow more, with less

In collaboration with

FlowerWatch
Quality assured

Post Harvest Technology & Water Quality **Training**

NITA
National Industrial Training Authority (NITA) Approved

60% flower quality can be lost in post harvest. Don't let that happen on your farm - learn more about mitigating the risks.

We'll offer 2 main training modules

POST HARVEST TECHNOLOGY

- Understand water relations and hygiene through the post-harvest and its implications
- Understand the importance of farm water quality
- Bucket washing and drying best practice
- Post-harvest additives that will increase your vase-life
- Treatments to prevent leaf yellowing

UNDERSTANDING WATER QUALITY AND WATER REPORTS

- Water quality and its effect on vase-life
- Post harvest water treatment options
- Importance of post harvest water testing and how to understand your report
- Waste water treatment and understanding your nema reports

The Training will be conducted in 2 towns as follows:

- 11th October- Limuru, Crop Nutrition (Cropnuts) Training Centre
- 18 th October- Nanyuki, Nanyuki Sports Club

Your investment: Ksh. 75,000 exclusive of VAT (for a team of 4 attendees)
Book your slot today by calling Billy **0728 294 008**

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Oserian Two Lakes Industrial

Oserian Development Company Finance Director Tim Ndikwe and Maxim Agri General Manager Mohamed Salman signed the agreement welcoming the agribusiness firm to the Two Lakes Industrial Park in Naivasha.

By CATHERINE RIUNGU

The journey towards realization of a business park at flower grower Oserian Development Company's expansive farm in Naivasha has kicked off in earnest following the signing of a $10 million investment

Nakuru Governor Lee Kinyanjui who presided over the signing of an agreement between the two welcomed the development terming it as the fruit of a close collaboration his government and Oserian have embarked on to establish a strong industrial base in the region to tap into global and regional markets.

Maxim Agri, a joint venture betweek Pakistan and the Netherlands investors becomes the first investor at the Oserian Two Lakes Industrial Park. A visibly excited Two Lakes Managing Director Robert Ward announced it was a major milestone for the company to welcome its first client, as it lays the foundation to showcase the seriousness of the venture. He disclosed that negotiations with three more investors are almost finalized and in the coming months they will welcome the new businesses.

Maxim is building a state-of-the-art cattle feed production facility scheduled to roar into operations in January 2021, directly employ about 160 people and significantly improve livestock production by providing superior animal feeds and genetics, Mr Kinyanjui said adding that Nakuru is positioning itself to be a leading exporter of beef to the Middle East and Maxim Agro inputs are geared towards supporting the plan. Increased animal production will translate into improved earnings and create employment for the youth in the supply chain, the Governor added emphasizing that demand for animal exports was on the rise going by inquiries and expression of interest.

Oserian kicked off its diversification programme in 2015 with a vision to develop an industrial park and evantually create 20,000 jobs in the agriculture value chain, aligning operations to Vision 2030 and the Big 4 Agenda of value addition and job creation.

Maxim Agri general manager Mohamed Salman said the firm took interest in the Two Lakes Industrial Park upon watching a video on Oserian after the Nakuru Investment Conference that was held in Naivasha late last year. The firm is a leader in animal feed production; additives, genetics, farm equipment, cow Comfort

Park signs up Maxim Agri

Maxim Agri General Manager Mohamed Salman: We have been searching for an entry point into the East African market and Naivasha provides the key with the Oserian Two Lakes being a great location

products, and seed distribution. Mr Salman said the Naivasha plant will be its centre for East Africa. "We have been searching for an entry point into the East African market and Naivasha provides the key with the Oserian Two Lakes being a great location with reliable and affordable energy in addition to simple turn key solutions that have removed much of the headache of entering into a new territory and a 'can do' attitude", he said.

Oserian's Finance Director, Tim Ndikwe, said the industrial park dream was finally becoming real and called on investors to follow Maxim Agri to set up at Oserian, as the farm solidifies its restructuring

For more information contact: Oserian Two Lakes on
+254 743031 670
info@oseriantwolakes.com

Craig Anthony General Manager Kisima Floriculture. I am proud to be a Kenyan flower grower over the years I have been in Kenya

Kisima Farm: Sustainability in flower farms

Flower farms cannot survive without sustainability, it incorporates what we all do, sustainability is not a chore, it is what benefits the company. What we do in Kisima is a strategy.

By ANTHONY MUTAI

"Why do we grow flowers, sustainably? Kenya is gifted with the environment for flower growing. We are on the equator and we enjoy standard rainfall throughout the year, we also have adequate hours of light and dark which most flowers need." Says Craig Anthony General Manager Kisima Floriculture. Nature has given an advantage of growing flowers in Kenya, flowers are grown more naturally than in Europe. In Kenya green houses are never heated like in Europe and carbon is never pumped into flowers. The green houses are designed to offer a conducive environment for the flowers.

Having started growing flowers in 1989, Craig had consultants from Israel and Holland. It offered an opportunity to learn. "The level of expertise in Kenya's floriculture sector is unmatchable, Kenya has created a whole breed of professionals in the sector." Adds Craig.

Kisima Sustainability

"Flower farms cannot survive without sustainability, it incorporates what we all do, sustainability is not a chore, it is what benefits the company. What we do in Kisima is a strategy." Says Craig. Kisima forestry department, donates wood for schools, the trees help in enhancing biodiversity, they act as windbreaks. Kisima supports seven primary schools and two secondary schools in the vicinity, with infrastructure development, feeding programme and bursaries. The water conservation systems, carbon offset and responsible farming puts Kisima farm ahead of the pack. The farm also hosts wildlife from the nearby parks. There is free movement of wild animals.

The Kisima duka organizes two major field days for arable farming attended by over 1000 farmers. Kisima also employs the local people. Kisima farm ensures trees planted are best for the region. "The eco-system favours us and we give back to the community. I am a total believer in environmental sustainability." says Craig. Kisima farm collects 100 % of its rain water. The strategy applied is thinking ahead of 5 years, in case of water shortage. Kisima recycles plastics, crops are grown in an ethical manner. Soil science is conducted by use of organic fertilisers , compost manure and ensuring the soils have good bacteria. The farm uses molasses, bone meal and almond seeds to enrich their soil with nutrients

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Biological Insecticide
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Biological Fungicide
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Biological Nemeticide
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The use and effects of

Farmers in Kenya, the majority of whom are smallholders who consistently produce more than 70% of the food we eat, are promised higher yields with the use of synthetic pesticides and fertilizers

By FELISTUS MWALIA

The use of pesticides in Kenya, gives Kenyans reason to question the safety of food. Research has shown that there are products on the market that have proven chronic health effects and negative environmental impacts (RTFI, 2019). The rise in cancer cases, different allergies and other non-communicable diseases can be attributed to the country's food system, which is increasingly dependent on agro-chemical inputs. The drive to ensure food security has perhaps overtaken concerns on the quality and safety of our food. Government interventions are mainly focused on food production – increasing the quantity of food available – neglecting important aspects of food quality.

Farmers in Kenya, the majority of whom are smallholders who consistently produce more than 70% of the food we eat, are promised higher yields with the use of synthetic pesticides and fertilizers. Depending on external inputs for production is capital-intensive and not environmentally sustainable, meaning it is not well suited to the Kenya's smallholder farming context. Of particular concern, is the toxic effects of some of the pesticides on non-target organisms and users.

Agriculture accounts for about 24% of Kenya's GDP with an estimated 75% of the population working in the sector either directly or indirectly. As an agricultural economy and while promoting mainly conventional agriculture, Kenya's demand for pesticides is relatively high and steadily increasing. In 2018 Kenya imported 17,803 tonnes valued at 128 Mill $. These pesticides are an assortment of insecticides, fungicides, herbicides, fumigants, rodenticides, growth regulators, defoliators, proteins, surfactants and wetting agents. Of the total pesticide imports, insecticides, fungicides and herbicides account for about 87% in terms of volume and 88% of the total cost of pesticide imports (AAK, 2018).

It's remarkable that the volume of imported insecticides, herbicides and fungicides has more than doubled within four years from 6,400 tonnes in 2015 to 15,600 tonnes in 2018, with a growth rate of 144%. The increase in pesticide use requires necessary safe guards to control how they are applied. Safe guards include amongst other things, the provision of personal protection gear, training for farmers and local agro-vets on how pesticides should be used and adequate product labelling. The responsibility for 'safe use', is borne by both government agencies and manufacturers.

Due to the high toxicity towards human health and the environment and due to their persistence

(length of time in the environment), many of the pesticides are banned or heavily restricted in

Europe. Despite European restrictions and interventions to use less hazardous products, some of the withdrawn pesticides are still in use in Kenya. Up to 32% of the active ingredients in the Kenyan market pose a serious potential impact on human and environmental health and are withdrawn from the European market (RTFI, 2019). Thirty-

pesticides in Kenya

one per cent of all registered products are toxic or very toxic to bees which threatens the survival of bee populations and other pollinators and negatively effects food security as our food and seed production rely on pollination (RTFI, 2019). The double standard lies in the fact that the products registered in Kenya, that are withdrawn from the European market, are mostly sold by European companies (75 products) (RTFI, 2019).

The effects of pesticide on environment is often underestimated, especially in African countries' registration procedures. This negatively exposes the ecological system upon which food production depends. Neonicotinoids, a commonly used class of systemic insecticides, cause soil degradation and water pollution and endanger vital ecosystem services such as biological pest control. Designed to damage the central nervous system of target pests, they can also cause harm to pollinators, birds and other wildlife.

Use of these insecticides has been blamed for the 50% decline over 25 years in honeybee populations in the United States and the United Kingdom (RTFI, 2019). This threatens the very basis of agriculture, given that wild bees and managed honeybees play the greatest role in pollinating crops. According to estimates from the Food and Agriculture Organization of the United Nations (FAO), of some 100 crop species (which provide 90% of global food), 71% are pollinated by bees.

We should question what is this business that we are allowing. Why are products withdrawn from where they are imported, allowed to be sold in our country?

The lack of a policy frameworks that enforces protection mechanisms has increased the risks associated with the use of toxic pesticides. Although the Rotterdam Convention, to which Kenya is signatory, establishes a prior informed consent procedure that allows countries to control the import of listed substances, this is clearly an ineffective protection mechanism against the availability of potentially harmful chemicals entering our food system.

Lack of a policy frameworks that enforces protection mechanisms has increased the risks associated with the use of toxic pesticides: Photo | Route to Food Initiative

In addition, there are no adequate monitoring and reporting systems for health and environmental impacts of pesticides, and information centers with requisite medical facilities to diagnose, treat and report pesticide poisoning are limited.

In 2013, within the National Pesticide Residue Monitoring Programme (NPRMP) undertaken by KEPHIS and funded by the EU, 1139 food samples were taken (KEPHIS, 2018; EC 2013). Out of these samples, 530 (46.53%) had pesticide detections, while 123 (10.80%) had exceedances of set EU maximum residue levels (MRLs). The established MRLs hindered the exportation of the produce to the EU hence remained within the country for local consumption, regardless of their safety and quality.

To achieve food security and fulfilment of the Right to Food in Kenya, there is a need to strengthen national and county institutions and regulations; enhance accountability and responsibility of pesticide manufacturers and distributors; and promote more sustainable farming systems. Farmers should be encouraged to apply integrated pests, disease and weed management in crops production to reduce exposure to toxic pesticides. Based on our context, small farms which also serve as homes to over 50% of our population, farmers should be encouraged to practice agroecological farming practices. There is need to also create awareness amongst farmers and the general public to increase the demand for safe and healthy food, which will support sustainable farming systems and is a preventative measure against diet-related illness.

The effects of pesticide on environment is often underestimated, especially in African countries' registration procedures. This negatively exposes the ecological system upon which food production depends. Neonicotinoids, a commonly used class of systemic insecticides, cause soil degradation and water pollution and endanger vital ecosystem services such as biological pest control.

Felistus Mwalia is Programme Officer for the Route to Food Initiative

Savannah Honey: The bee keeper's partner

Savannah Honey undertakes the delivery and installation of the bee hives

By ANTHONY MUTAI

In 2011, Kyalo Maveke with other 3 directors started Savannah Honey, a leading company in promotion of Honey, Propolis, Royal Jelly and Bee venom production in Africa.

This was after realizing that beekeeping was the only solution to the perennial drought in his home county Makueni. They approached groups that took interest in bee keeping to provide them with Langstroth beehives. The self-help groups however had the challenge of affording the bee hives. They took to supporting the clients by giving them the langstroth hives on loan terms.

"Savannah Honey gives hives to clients on loan terms. Under this programme, clients are required to save a minimal amount of money and get at least 5 hives each client and then repay the loan within a year" Says Maveke.

Savannah Honey has over 4000 clients in East Africa. Their partnership is in Kenya, Uganda and Rwanda.

In Kenya Savannah honey has clients in 27 counties, with groups made up of 20 people. The clients are funded as a group but they own their beehives individually.

Kenya is low in bee keeping but there is a lot of potential. Kenya imports 80% of honey consumed from Tanzania. "Savannah is at the forefront of advancing the technology to tap into other bee products. Their value is too high." Says Maveke.

Benefits of Modern Bee Keeping.

Traditional hives are not used commercially, harvesting of honey is done traditionally and it leads to the crushing of combs which may kill the queen bee. The bees also might abscond the hive. Harvesting is done once a year.

The Modern hive has two chambers which separated by the queen excluder, this ensures the queen does not go to the harvesting chamber. During harvesting they use the honey extractor, which ensures the queen is not killed and leads to 3- 7 harvests in a year.

Modern bee keeping does not rely on the principles of production. No requirements for inputs

The modern bee hives are waxed to attract bees and also its not time consuming.

"Modern bee keeping is a lifetime venture with a guarantee of 40-60 years. The first harvest is done after 5-8 months followed by harvests of 2-3 months afterwards. This can be a good poverty alleviation project, we also offer training on bee keeping as a retirement project." Says Maveke.

It is worth noting that cold areas tend to take longer in colonization than the dry areas. However due to the many flowers in the regions they help more on the production.

Savannah has a programme for macadamia, avocados and watermelon farmers which increases pollination and maximizing production.

Technical support

Savannah honey supports the clients to ensure maximum production. They handle delivery and installation of bee hives free of charge together with other technical support which is factored by citing to ensure that the hives are colonized. If they are not colonized within 60 days, they do colony division which is a technique of making a queen for the uncolonized hive. "We ensure that the colonies are very strong for maximum production. Colony strengthening ensures that each hive produces 10-15 kilograms of honey.

A queen lays 15000 eggs a day. Any queen who is sickly, weak or dormant will result to the colony being weak, they undertake re-queening to super impose a new queen. They use a catch box to make a queen where they kill the old one.

Markets

Savannah Honey provides clients with market for the produce through a renewable contract of 5 years. If a client gets a good market they are free to sell but they retain 20% to Savannah honey.

Challenges

The honey badger is the main challenge affecting the bee keepers, they are mainly found in the inhabited regions. They break the hives to get the honey. The ants also feed on the honey combs.

To control these challenges, farmers are trained on how to control and manage the challenges.

Bee products

The royal jelly which is the queen's food is mostly used in cosmetic industry. Wax is used in candles and shoe polish. Bee venom is used in pharmaceuticals industries.

Propolis: The unexploited money maker.

The demand for propolis in Kenya has skyrocketed with very few people engaged in its production mainly because of lack of information.

Propolis is a high income earner which if exploited can triple the income of a beekeeper.

Savannah Honey supplies 20 and above specialized langstroth hives together with the Propolis Collectors to the client (for commercial purposes we advise clients to start with 20 hives or more but clients can also start with few and increase the number with time)

"Many people think of bees only in terms of honey. While honey itself is great for wealth, health and job creation, it is of the lowest value compared to the other bee products," says Kyalo Maveke

Propolis is a sticky substance collected by bees from buds or bark of trees.

Bees use the material for reducing the size of the hive entrance, filling cracks, polishing the interior of the hive, strengthening comb attachment, killing intruders by covering them and as barriers against ants (nest defense).

Savannah Honey staff offer training and issue beehives to farmers in Siakago,embu County

Propolis is used in human medicine and for veterinary purposes. Currently several pharmaceutical companies across the world use propolis in the production of drugs. Several other companies use propolis for manufacturing of medicinal soaps because its antibiotic properties inhibit the growth of microorganisms.

It is also used for making adhesives e.g. glue, wood pastes for sealing leaking roofs and cracks on wooden furniture. When chewed it heals backaches.

Commercial propolis harvesting involves the use of the propolis trap which is a plastic mesh sheet which the bees use to build the propolis on.

Savannah Honey is currently recruiting over 1,000 clients on a 5 years contract for production of honey and Propolis. Under this programme;

Savannah Honey supplies 20 and above specialized langstroth hives together with the Propolis Collectors to the client (for commercial purposes we advise clients to start with 20 hives or more but clients can also start with few and increase the number with time)

-Savannah Honey undertakes the delivery and installation of the hives.

-Savannah Honey manages the apiary (provides technical support to ensure maximum colonization and production). Savannah Honey provides harvesting and marketing services for 5 years.

At an event the client gets a buyer with a better offer, they can sell to them but retain at least 20% for Savannah Honey.

EXPENDITURE FOR THE FIRST YEAR

Equipment	Cost	Quantity	Total(Kshs)
Langstroth Hives	6,500@	20	130,000.00
Propolis Trap	3,200@	20	64,000.00
Miscelleneous			20,000.00
TOTAL			**214,000.00**

INCOME

Honey

Kgs/Harvest	No Of Hives	No. Of Harvests/Year	Price Per Kg	Total(Kshs)
10	20	3	500.00	300,000.00
Propolis				
Kgs /Harvest	No Of Hives	No. Of Harvests/Year	Price Per Kg	Total(Kkshs)
3	20	4	1,900.00	456,000.00

You can contact savannah honey on; +254721965337
info@savannahhoney.co.ke,, http://www.savannahhoney.co.ke/

JKUAT lecturer appeals for $ 600

By MURIMI GITARI

She is probably one of the most resourceful people in the horticulture industry and especially when it comes to fruits. Her passion for fruits is undoubtful when she takes her time to explain all the chemistry in breeding of the papaya fruit. Dr. Freda Wanzala, the brains behind the transformation of papaya in Kenya, is a Lecture at Jomo Kenyatta University of Agriculture and Technology and a holder of Bachelor of Science in Horticulture from Egerton University, Master of Science (Horticulture) from University of Nairobi and a holder of PhD in Agricultural Science from the United Graduate School in Japan. When **HortiNews** *catches up with her at her office in JKUAT,* **Dr. Fredah Wanzala**, *who has tasked herself in elevating papaya by breeding to get the best products that will go to unprecedented records, looks so full of hope as she has already developed 4 varieties for Kenya that are resistant to viral diseases. She takes us through this journey of her love for fruits.*

Dr. Fredah Wanzala

Why specialize in fruits?

Fruits are very special. When they ripen you eat them without even having them cooked as they are ready-to-eat. I developed interest in post-harvesting while in college and that's where my interest on fruits begun and decided to contribute in them for our country. Fruits are antioxidants which mean if you process them, you will destroy vitamins in them especially vitamin C that is of great value to our bodies.

Your journey with Papaya breeding.

After I was done with my masters, I decided to develop these crops where I started by handling post-harvest. I came up with aprodyzation- a set of Chromosomes to develop the fruit but in the process I came up with 3 chromosomes that were 75 percent triploids. This gave me more interest on doing more research and I wrote a proposal that was then funded. It is during this time, we came up with 4 new varieties that were resistant to viral diseases in Kenya. One major threat by viral diseases is that when they heat they can clear a whole field with crops.

What was your next step after discovering the 4 varieties?

We visited all the places producing Papaya looking for 3 things. If there are any Papaya in the country that are tolerant to viral diseases, any kind of yellowing, strapping or ring spots on the fruits or generally symptoms on the trees and if there were clean trees or free from diseases. We isolated those that had no problems when doing our findings and some proofed resistant to diseases. This led to cross-breeding programme in evaluation of the product for high yields, resistant to viral diseases and dwarfness.

Where did you carry out the trials?

We did multi-locational trials in Mitunguu irrigation and in KARLO, Mwea and out of these trials; nothing went below the international standards. Mitunguu Irrigation Scheme gave the best data with the sweetest papayas. They contained over 90 percent soluble sugars and picked the best of them all and took it to Kenya Plant Heath Inspectorate Services (KEPHIS) and the 4 varieties were gazzeted in November 2017. This was after doing an application to KEPHIS to get breeder rights which was not met by any objection.

Are there best or natural ways of controlling pests in papaya?

Yes. I would recommend the use of concoction that comes from mixing pesticides and soap detergents as commonly used by farmers where the detergent acts as a sticking agent. One can also use hot pepper and Neem

to have her papaya breed registered

leaves (muarobaini) where you mix the two with a soap detergent and leave the concoction overnight and sieve it the following day for spraying.

Hass has a hard skin giving it a longer shell life as compared to fuerte that has a soft skin. It is a regular bearer with the potential of commercialization. Fuerte is an alternate bearer whch is a disadvantage due to the fact that it can for one or two years without bearing after a very heavy harvest. When hass ripens the skin turn purple but fuerte remains green.

Apart from Papaya fruits, are there other fruits you are interested on?

The Avocados. Currently there is a very high demand on this precious fruit and both the domestic and export markets are very demanding and I think it is the right time we start thinking about avocados because farmers have been doing it the wrong way with the international market putting very stringent measures in their markets for this produce. Hass and Fuerte varieties are the most common for the export market in Kenya with Hass variety being on demand but there is an assurance within the next 5 years the production for both will be 50-50. Avocados are the only crops that open flowers twice, that is the male and the female.

The differences between the two varieties.

Hass has a hard skin giving it a longer shell life as compared to fuerte that has a soft skin. It is a regular bearer with the potential of commercialization. Fuerte is an alternate bearer whch is a disadvantage due to the fact that it can for one or two years without bearing after a very heavy harvest. When hass ripens the skin turn purple but fuerte remains green.

What is your take on avocado growing in Kenya?

Avocado harvesting seasons ends in August after the fruits take a period of between 6 to 8 months to mature. During the month of September to March there are insufficient avocados in the farms therefore being low or off peak season. The country is not able to produce enough for the market and there is need to gear up and produce more that will make avocados become the leading exports for the country. This will not only bring more income to the farmers and the country through tax but also increase the GDP of the country. In sab-saharan Africa, Kenya is the number one exporter of avocados. Kenya is hundred percent tropical and crops can be grown at any time, this is why everyone wants our avocados.

Are we doing it the right way?

Our farmers lack basic knowledge on growing avocados and a lot needs to be done sice once you fail at the beginning which is by picking the wrong seedling and planting it the wrong way, one should not expect much at the end of the day. They should be educated on getting the right seedlings and planting them the right way for them to get the best produce at the end. Zions for grafting the seedlings should be from a tree that has an economic age 7 years. The seedling that develops into a fully grown tree should be fed with sufficient nutrients that contain Phosporus, Nitrogen and Potassium, sufficient ventilation of light by way of pruning and enough water. A seedling requires 20 litres of water in a day. It is also essential to do soil analysis before planting to determine the kind of nutrients to use. Mature trees also need to get enough lighting when fruits start to form. A mature tree can produce over 1000 fruits in a year. Many Kenyans rely on rainfall for farming; the demand for seedlings is therefore high during rainy seasons.

Parting shot

We are yet to get funds to have the papaya breed fully registered in Kenya and will be glad if we get someone to fund the project which requires about 600,000 Kenyan Shillings. It's the only thing we lack but when this is done, then the crop will be fully recognized in the country. It has been a long journey and it is my hope we will get someone who will support this noble project by way of funding it wholly. Once the whole registration is complete, I would call it a legacy that I have given the horticulture industry and being not only being the first person to breeed Papaya but also the only woman who will have transformed the Kenyan Papaya for better yields and best quality.

as well as making worm juice which is used to further enrich the soil with good bacteria and nutrients. The farm also embraces use of Integrates Pest Management (IPM) which Mr. Anthony says is more than just using insects to eat pests. IPM also covers other areas such as what time to harvest, using good nematodes for the soil and even how clean the plants.

"Sustainability is embraced by a team, use nature to grow nature," adds Craig.

Craig says he challenges the carbon issue. At a time when the country had the fertilisers crisis Kisima farm coped with the crisis. the farm was able to survive the period by lowering the use of organic fertilizers to a level that would still sustain the flowers. Kisima farm changed the program on information and supplies. Craig credits his close relationship with the farms suppliers as having enabled him to be better prepared for the shortage by making adjustments in line with what was available. Due to this, no production was cut. He however said that had the crisis carried on longer that the farm could have lost production. He stresses that Kisima has planned its strategy based on the worst-case scenario.

Kisima farm has 450 employees from the community, who also include people with disabilities. They are committed to promoting gender equality among the employees. The farm rewards its employees based on the best performance. The farm also gives internship to university students which equips them with the knowledge of growing flowers.

Worms break down rose waste ,digest it and put it out as worm juice which is used to further enrich the soil with good bacteria and nutrients.

Awards.

Kisima farm was recognized for the best imported roses at the keukenhof awards with Rosa Hurricane as their leading variety. Judgement was based on the merits of head shape, opening of the head, colour, strength of the stem and vase life. Kisima farm also won the gold award from the National farmer's competition scheme. Kisima bagged the gold award in the category of growers under 30 ha. The merits were based on the management of the farm such as on farming practices and sustainability.

Water sustainability

Very few flower farms tap water from the rivers, most have their own lagoons or boreholes. "Our rivers need to be safeguarded by everyone, we are the guardians of this land." Says Craig. He adds that the hectares of land to be cultivated are determined by the water available. Kisima farm has been having rainfall records going back to 50 years ago. Kisima harvests all its rain water from their greenhouses and its channeled to its lagoons. The farm boasts of 5 lagoons with lagoon 1 kept open and animals water from it. They also keep fish in the lagoons. Lagoon 2 is the main lagoon that is used to irrigate the flower farms and all lagoons have pipes and pumps connected to it. In case of a shortage water is pumped into the main lagoon.

Kisima recycles its water using the hydroponic system used in some of the green houses. Notably Kisima is one the few flower farms that do not rely on boreholes for their farm operations. The farm also uses the wetlands system to purify any waste water from the pack house. The farm is designed downhill from up to down with spill ways that lead water back to the community.This is part of the sustanaibility

Post-harvest Sustainability

When it comes to post harvest sustainability, Kisima uses solar power which supplies 70% of its post-harvest operations such as the cold storage for flowers that have been graded. For transport, the farm cuts down its use of fuel by using a freight company which extends its services to the other surrounding farms on a door to door basis. The farm has a contractual agreement with the freight company which minimizes cost and keeps the cold chain alive. The diversity of flowers grown is impeccable, the freight operations have grown. "Looking back in years where we used generators due to lack of power, lorries being towed by tractor and now, change has really happened," asserts Craig.

Communication has also improved by checking and monitoring delivery of flowers to the market at the comfort of the house.

Pests and diseases

On pests and the rising worry over the False Coddling Moth, Mr. Anthony says the farm has not been affected as it is not common in the Mt. Kenya region. "No responsible grower would rule out an FCM, there is need to educate your people about it." Says Craig. Kisima farm has had 5 trainers on FCM ,2 external and 3 from Kephis. Kisima also sends one of its growers to get training in Naivasha and Holland. Craig acknowledges that FCM is a problem for the industry and there is need to fully understand it as a team.

Thrips

"The only way to deal with thrip pests is to share information among growers." Says Craig. Thrips are the only 'dudus' with 5 stages of development. Proactive sustainability such as traps, understanding thrips, venting precautions and application of biological means to fight thrips is evident in Kisima farm.

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