

January - February 2022

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## The Leading Floriculture Magazine

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## Fellow Growers

*As we come to the end of the Year 2021 and we usher in the New Year - 2022, Floriculture family is delighted to convey our best wishes to all growers, input suppliers, consumers and any other stakeholder in the flower sector.*

*The dawn of a New Year is not just a calendar event that marks the passage of time. It symbolizes transition, renewed hope, new opportunities and limitless possibilities. A New Year brings with it the chance for rebirth, renewal as well as restoration.*

*But we cannot experience the 'newness' of a new year without a renewal of minds. I say so because you cannot seize the opportunities and limitless possibilities of 2022 if we are stuck in the mindset of the old year 2021 and the previous years.*

*This year just ending has tested all of us immensely – individually as well as collectively as a sector – it has tested us in ways we have never experienced before; we have experienced many individuals as well as collective tragedies. But, it has also been one of numerous unstated individual as well as collective triumphs; for in the moment of adversity lay also the seeds of opportunity.*

*We were caught up in the middle of this new normal. We have had numerous shutdowns in business and fewer start-ups. But, I believe that this downturn is an opportunity to re-imagine our*



*business models and embrace innovation. Yes, indeed, I do believe that the year 2022 is the year of rebuilding.*

*Let us adjust our mindset and embrace the spirit of renewal and hope, possibilities, growth as well as triumph. The New Year presents a unique opportunity to re-build.*

*Happy 2022*

*Masila Kanyingi  
Editor*



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# Kenyan Flower Growers are Still Throwing Away 25% of Daily Harvest

Freight, the taxation regime, and the EU plant health regulation were predicted to be the biggest challenges for the Kenyan floriculture in 2021, according to Kenya Flower Council's (KFC) CEO Clement Tulezi. "When I was predicting that earlier in the year, I was not wrong. These three have remained the major challenges, and not much has changed since, unfortunately." In this article, Tulezi goes over the current state of these challenges, as well as a new challenge the Kenyan flower industry is having to deal with and how Tulezi's association is helping to find solutions and improvements.

## 20-25% of daily harvest thrown away

According to Tulezi, their top priority at the moment is freight. "In 2020, we temporarily lost demand for our industry, and the airlines found better business elsewhere because of Covid. As a result, the freight costs have gone up, and this situation has persisted. We are still short on capacity. There are still many cancellations. Almost every two days a flight to Nairobi is canceled, meaning that the capacity has not improved. The sector falls short of 1500 tons per week. As a result, the majority of growers and exporters are throwing away 20-25% of their daily harvest. Meanwhile, the demand for Kenyan flowers is good. These growers have invested a lot into their production, for which there is actually enough demand, but there is no space to transport it."

In addition, the costs of transporting the Kenyan flowers have remained very high. "Moving produce from Nairobi costs on

average \$2,60 per kilo, whereas this only costs \$1.50 for the Ethiopian market. When all other factors are held constant, how can the Kenyan market compete in the same market?"

So how can we overcome the freight challenges? The KFC is working closely with airlines and freight forwarders, in order to find short-term solutions. So far, they have provided several suggestions to the government. "First of all, the government could allow to bring in more capacity into Kenya. However, this is quite difficult as this is dependent on the airlines as well. Our second suggestion is to allow direct flights from Nairobi to the point of destination, which would reduce costs. Our last suggestion is for the government to waver some of the extra costs related to airlines operating in Nairobi, so we attract more."

According to Tulezi, something needs to happen soon. "We already have a freight shortage of 1500 tons currently, so what will happen around Valentine's Day, for example? Farms cannot keep destroying flowers.

This will have a serious ripple effect as it will affect the way businesses are run. Drastic measures may need to be taken, such as reducing the staff or inputs, for example, to reduce the costs, which will in turn be compromising the quality of the produce."

## "A highly taxed industry"

Tulezi explains that floriculture is a highly taxed industry in Kenya. "The government finds it easier to target us, as we are a well-organized industry, since a lot of other





Clement Tulezi, Kenya Flower Council,  
on the major challenges in Kenyan floriculture



**Mr. Clement Tulezi,  
Kenya Flower Council CEO**

**Freight, the taxation regime, and the EU plant health regulation were predicted to be the biggest challenges for the Kenyan floriculture in 2021, according to Kenya Flower Council's (KFC) CEO Clement Tulezi. "When I was predicting that earlier in the year, I was not wrong. These three have remained the major challenges, and not much has changed since, unfortunately." In this article, Tulezi goes over the current state of these challenges, as well as a new challenge the Kenyan flower industry is having to deal with and how Tulezi's association is helping to find solutions and improvements.**

sectors are more small scale or informal. Both at county and national level, floriculture companies are imposed with over 40 taxes. Recently, we went to court against cess fees, which is a form of tax charged on goods when they move across county borders, and we won all the cases in Nakuru and Meru, and also the one on the Minimum Tax. The court ruled that counties do not have the jurisdiction to levy these cess taxes on our export industry. However, a new tax has now been introduced, the Flower Service Tax, by a county where we grow most of the cut-flowers, charging 1% of the turnover on all exporters. We have already put in our objection, and hopefully, they will listen. We also have an ongoing court case against the Horticulture Crops Directorate, which increased cess tenfold at the beginning of

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## Main Story

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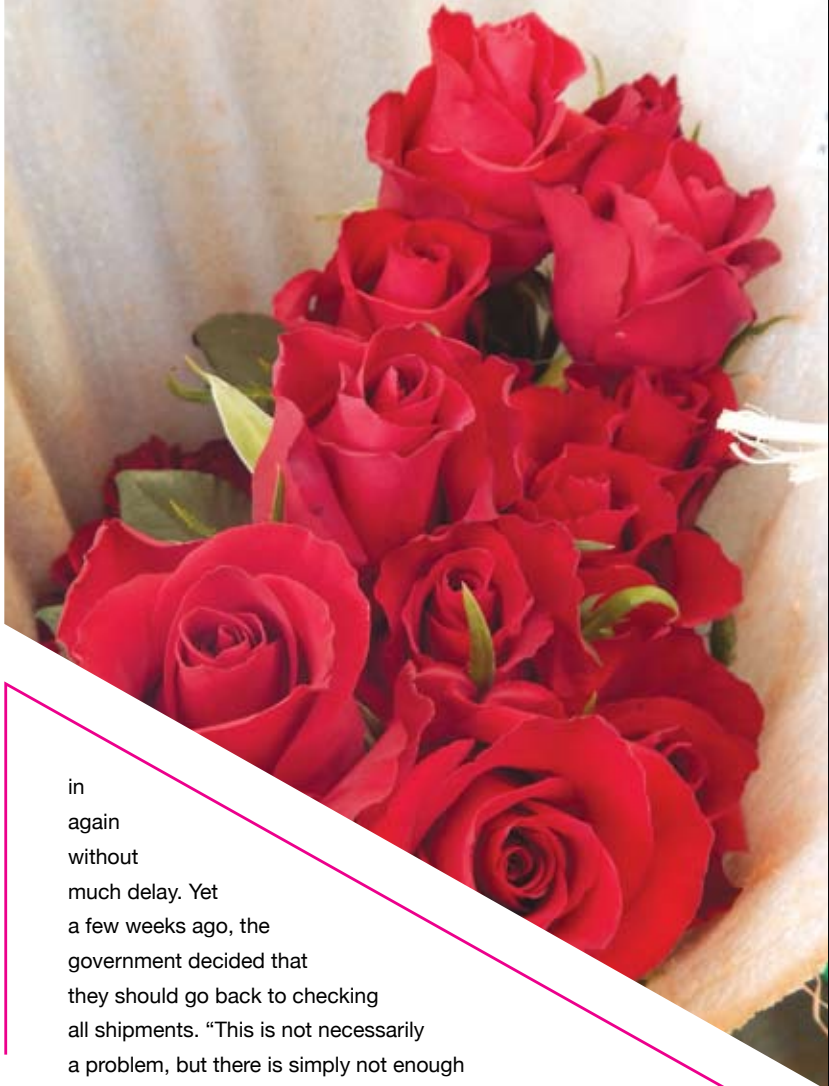
2021. Overall, there is a new tax introduced almost every 3 months. Of course, it is costly for KFC to keep hiring lawyers and going to court on behalf of our members, but it seems like it's the only way to work with the government and reduce the unnecessary costs for Kenyan companies.”

#### EU plant health regulations

Another challenge the Kenyan growers have had to deal with is the plant health regulations imposed by the EU. “False Codling Moth is a pest that often occurs in roses, but also on capsicum and many other crops. At the moment, it looks like there are improvements concerning the interceptions. However, we need to steady this over time in order to avert more sanctions from the market. We are working closely with the Kenya Plant Health Inspectorate Service to look at the post-harvest processing, and how we can manage the pest in a better way. Soon, we will also be starting a project where we will start using cameras and drones to detect and destroy the moths, as we do not want this to adversely affect our business.”

#### A new challenge: fertilizer checks

Recently, the government has also decided that it is necessary for all water-soluble fertilizers to be checked when they come into the country. In 2018, KFC had to fight against it, and the shipments were able to come



in again without much delay. Yet a few weeks ago, the government decided that they should go back to checking all shipments. “This is not necessarily a problem, but there is simply not enough capacity to check every single shipment. At the moment, 6000 tons of fertilizers are stuck at the port, which is causing fears of shortages and increased prices. These products are used on a daily basis by the farms, so this delay will have a major impact on the quality of the flowers. Especially after a difficult 2020, we want our industry to recover with the right quality, and this move is not helping us.”





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## Main Story

### Summary

- *Kenya Flower Council (KFC), the lobby for large-scale flower farms, says they need freight capacity of at least 5,000 tonnes a week against the 3,500 tonnes available.*
- *The government has been reluctant to allow Ethiopian Airlines, for instance, to increase its capacity from Jomo Kenyatta International Airport (JKIA).*
- *Europe accounts for nearly 70 percent of Kenya's cut flower exports and the limited cargo capacity and high freight costs are making it difficult for Kenya to serve this market, threatening thousands of jobs.*

**F**lower farmers in Kenya are being forced to throw away a quarter of their produce due to a drop in airline traffic in the wake of restrictions imposed on rival carriers to protect Kenya Airways.

Kenya Flower Council (KFC), the lobby for large-scale flower farms, says they need freight capacity of at least 5,000 tonnes a week against the 3,500 tonnes available. The government has been reluctant to allow Ethiopian Airlines, for instance, to increase its capacity from Jomo Kenyatta International Airport (JKIA).

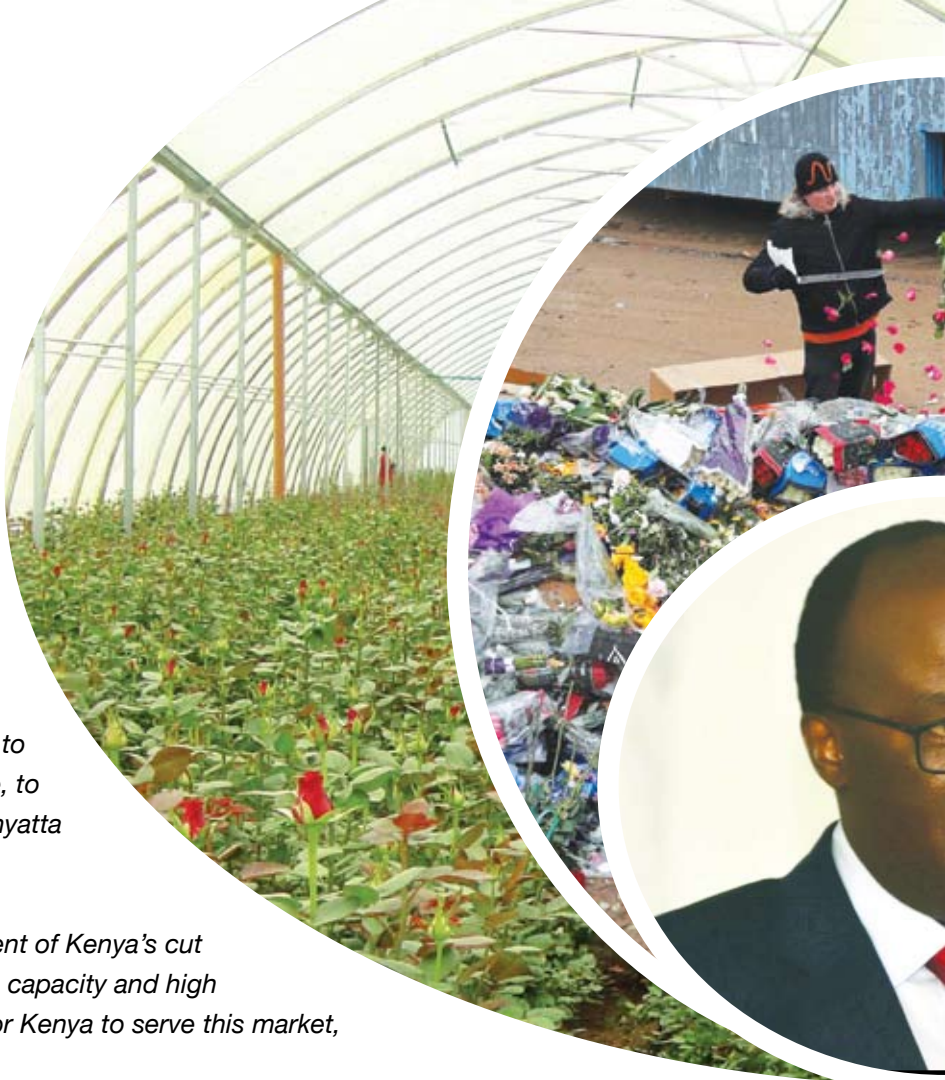
“On average our members are dumping flowers equivalent to 25 percent of their produce because of the limited cargo capacity,” said Clement Tulezi, chief executive of the Kenya Flower Council.

“It’s unfortunate that this is happening when we have increased orders from our

major markets in Europe and elsewhere.” Europe accounts for nearly 70 percent of Kenya’s cut flower exports and the limited cargo capacity and high freight costs are making it difficult for Kenya to serve this market, threatening thousands of jobs.

The exporters say the coronavirus pandemic led to grounding of most carriers that used to offer extra capacity on the Nairobi route while on a return trip after offloading cargo in Egypt and South Africa.

The pandemic has also seen airlines target vaccine cargo, which offers higher returns than conventional freight such as flowers. Kenya Airways has compounded the problem by resisting a plan to increase frequency for other airlines on the Nairobi route, having successfully lobbied the government to protect its turf at the expense of flower farmers.



**Mr. James Macharia, Transport Cabinet Secretary**

## Flowers rot in f Ethiopia fr

Kenya has said it will not approve additional freighters from Ethiopian Airlines after Addis refused to allow KQ to fly cargo directly to Europe from Bole International Airport, forcing the national carrier to route through Nairobi.

Transport Cabinet Secretary James Macharia said KQ has committed to increasing capacity and the government will approve any other carrier apart from Ethiopian Airlines to increase frequency from Nairobi to Europe.

“We met with the flower lobby and KQ and agreed that the national carrier will commit





Transport Cabinet Secretary

# Farms amid KQ, freight wars

to increase capacity which they have confirmed in writing," Mr Macharia said yesterday in a phone interview.

Mr. Macharia said he has also asked the exporters to recommend other carriers to boost freight capacity from Nairobi and not Ethiopia Airlines.

"The only interest they are pushing is Ethiopian Airlines which we refused because they denied KQ flying from Addis to Europe, forcing us to fly back to Nairobi," he said. The Cabinet Secretary said that he has approved requests of two airlines, including British Air.

Flower exporters are concerned the inadequate airfreight capacity in the middle of high season is hurting orders.

Kenya's floriculture industry enjoys a relatively long high-season, which runs from September through May, peaking in February as flower farmers maximise on the festive season, Valentine's Day and Mother's Day.

Thika-based Flower farm is harvesting 250,000 flower stems a day, and is able to export 137, 500 due to the cargo hitch.

"We cannot export about 45 percent of flowers. We have simply turned the more 100,000 stems into compost and this is not sustainable," said one of the directors. "We are hurting both ways because the shortage has led to higher freight costs." Freight cost has increased to \$2.6 per kilo of flowers from \$1.5, shrinking exporters' margin.

The flower council said the problem of limited cargo capacity has been persistent even during the low season but was not adverse as farmers exported 3,800 tonnes a week.

Kenyan farmers were forced to throw away millions of rose stems last year as Europe sealed borders and residents put weddings and funerals on hold to curb the spread of Covid-19.

But demand has returned as restrictions ease, and growers were hoping the business will recover fully this year.



# Fungicides, Resistance and their Management

**F**ungicides work by stopping or inhibiting fungal growth, sporulation or germination of spores. Different fungicides act on different stages of the fungal lifecycle and not all fungicides are effective against all fungi. Resistance occurs when a pathogen that was once sensitive to a fungicide is no longer sensitive (not controlled). Managing the use of fungicides and fungicide resistance in farms is important and can be achieved with planning.

## Protectant, curative and eradicant products

Fungicides are categorised by the stage of the disease cycle they target. Although the life cycles and biology of pathogens as a whole are very diverse, the disease cycle can be split into the following generalised stages:

### *Infection (penetration of the host plant)*

Colonisation (multiplication of the pathogen within the local area of infection in the plant before symptoms occur)

### *Symptom expression (visual signs of disease)*

Spore production and spread (normally occurs multiple times per year, depending upon the pathogen and environmental conditions)

**Protectant or Preventative fungicides** are often broad-spectrum products effective

against a wide range of fungi. They act in the infection stage by providing a protective barrier that prevents infection.

Protectants are designed to be applied to healthy plant tissue to protect or prevent infection from taking place. They stay on the surface of the plant; they do not enter plant tissue. As such these products tend to have limited impact on colonisation, symptom development or spore production that take place after the pathogen is inside the plant. Where pathogens grow and sporulate on the surface of the plant (e.g. mildews, grey mould) these products can be very effective.

Many protectant products have multiple modes of action, which decreases the risk of inducing fungicide resistance. Repeated applications will be required leading up to and during periods of high disease pressure.

**Curative or Penetrant fungicides** act in the infection and early colonisation stages, before symptoms are visible. These products enter plant tissue and stop or reduce fungal growth; they can be translaminar (moving across the leaf from top to bottom) or systemic (move throughout the plant via the vascular tissues). Protection from fungal attack occurs within the plant cell, though they may also provide a protective barrier to



reduce infection. They are more specific in their mode of action, generally only stopping fungal growth or development in one or a small number of ways. For this reason, these products may control a small number of diseases caused by closely related organisms. As a consequence, resistance is more likely to occur in these fungicides compared with protectant products.

They are best applied as soon after infection as possible (e.g. 1–3 days) as product efficacy decreases dramatically with time after infection. In other words, apply these products before symptoms are obvious and well before they are widespread. Repeated applications are normally required during periods of high pest pressure. Leaves produced after application are not protected and sporulation may still occur depending on the pathogen.

Despite the name, these products do not necessarily 'cure' plants.





**Eradicant fungicides** act on the later stages of colonisation (when symptoms are present) and can sometimes also act to suppress spore production. These products also stop or reduce fungal growth, which in turn stops or reduces disease development. Symptoms that have developed before the application will remain on plant tissue as long as it is present, e.g. leaf spots will remain on the leaf until it drops or is pruned out. Eradicant products are more likely to be systemic in action and may have some activity to new growth depending on the mobility of the product.

These products are very powerful for managing local fungal infections. However, they do not 'eradicate' fungal infections that are systemic within plants (e.g. vascular wilts and root rot pathogens). For this reason, fungicides are not recommended against plants infected with root rot and wilt pathogens in farms. Similar to curative products, eradicant fungicides effect fungi in a specific way and are more at risk for inducing resistance.

Regardless of whether the product is a protectant, curative or eradicant fungicide, they are most effective when used early, before symptoms actually appear or when symptoms are very minor. Fungicide efficacy will vary with many conditions including the pathogen present, the host plant, the amount of time since infection and the amount of pathogen present in the growing area (the inoculum load). Efficacy will also vary with the concentration of the product and environmental conditions. It is not recommended to apply products when plants are heat stressed, when leaves are wet or when leaves are expected to become wet, e.g. through rain or irrigation. Fungicides may struggle to manage widespread diseases.

#### Fungicide mode of action groups

All fungicides have a mode of action

combination) indicates that the fungicide stops the pathogen in a specific way, which is different from other codes. For example, azoxystrobin has the FRAC code 11 whereas tebuconazole has the FRAC code 3 their mode of action is different. Some countries do not use this system.

Understanding fungicide mode of action is complicated and requires a great deal of research to pinpoint. This is why some products are classified as group U, unknown mode of action. As new research becomes available, products may be moved from U to another mode of action group. However, sometimes information becomes available that makes a product be moved between mode of action groups.

#### Fungicides and beneficial insects

Fungicides often have a very deleterious effect on predatory insects and mites.



**Powdery Mildew on Flowers**

group as assigned by the Fungicide Resistance Action Committee (FRAC). Most countries have legislated the requirement for the mode of action group to be printed on fungicide labels.

Each distinct number (or letter number

Some products may kill predators, parasites and pollinators outright. Other products may have non-lethal effects including a reduction in the number of eggs laid, reduced movement or reduced longevity.

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## Crop protection

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Repeated applications will increase negative effects, as will higher dosage.

Fungicides vary in the groups of fungi they affect; they are not effective against all fungal pathogens. Initial studies are normally conducted to determine the types of species or groups that are sensitive to the product; these are then put on the label. Some fungi will have an inherent or natural resistance or tolerance to the product, though the exact mechanism is rarely studied. While this is a type of resistance, it is not normally considered in detail.

Of greater importance is what is termed 'acquired resistance', where populations of a fungal pathogen that were once sensitive to a fungicide are no longer sensitive. As such, control is no longer achieved, sometimes dramatically so. Acquired resistance is a heritable trait that allows the fungus to survive an application of a particular fungicide. It generally occurs when products with a common physiological mechanism of action are used repeatedly, each time selecting for the resistant individuals, allowing them to eventually dominate a population.

Fungicide resistance is more likely to occur when the fungicide mode of action can be overcome by one inherited trait (e.g. most curative and eradicant products). In contrast, it is less likely to occur when the product has multiple modes of action. This is why fungi rarely develop resistance to products from the M mode of action group (protectants); individuals rarely occur that have all of the traits necessary to survive.

Fungicide resistance is a numbers game, although only one spore/strain may initially have the ability to escape the action of the fungicide, with repetitive application the resistant population can rapidly increase. Fungicide resistance can occur from a

number of general mechanisms. The most common fungicide resistance mechanisms result from the fungus breaking down the fungicide or rendering it ineffective.

Management strategies to reduce

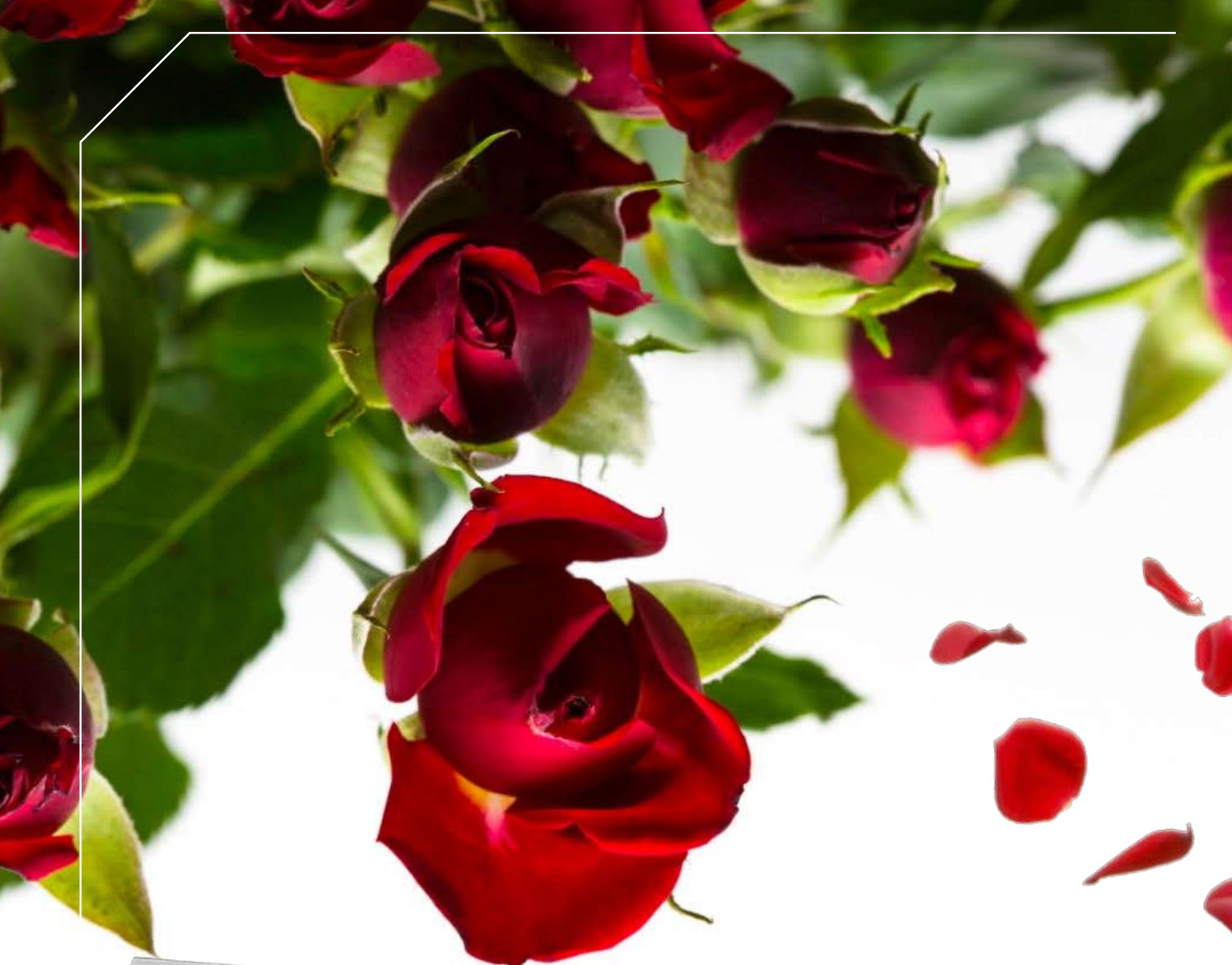
resistance

Various management strategies have been developed to reduce the incidence of fungicide resistance. Do not rely on any one of these strategies, implement as many as possible. Many products have a fungicide resistance management plan written on the label. Follow this strategy whenever it is available. When no resistance management plan is provided on the label the following guidelines can be used to reduce the likelihood of inducing



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**Preventive & Curative Fungicide**  
for the control of Downy mildew on roses

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fungicide resistance. More detailed information is available in the FRAC fungicide resistance monograph.

**1 Use cultural practices to reduce fungal populations and break the lifecycle of the pathogen.** Any action that keeps plants healthy and reduces the need to apply a fungicide will decrease the likelihood of inducing resistance. These actions are passive and perhaps the most important. Specific cultural practices that reduce disease pressure are discussed in many management plans and factsheets. In particular, avoid continuous plantings of susceptible crops, especially when they are showing symptoms. Reducing the number of treatments applied per crop drastically reduces the risk of inducing fungicide resistance.

**2 Only apply products when they are actually necessary.** Apply them when crop monitoring indicates that there is a need or when previous experience indicates that disease pressure is likely to be high.

**3 Apply to hot spots as much as possible.** Record susceptible crops and avoid applying pesticides to plants that do not require it.

**4 Apply protectant products leading up to high risk periods on susceptible crop lines.** Also note that certain fungal leaf pathogens can eventually become systemic vascular pathogens (e.g. downy mildew, Pestalotiopsis on some palm species). Once this occurs the plant cannot be cured and should be hygienically discarded. The disease should be managed early to reduce sporulation and ultimate crop loss. Large infestations generally require more applications to manage and may result in more genetic diversity, which may include a resistant variant.

**5 Limit the use of the eradicator and curative fungicides to highest risk periods of the growing season where the pathogen could be most devastating.** Disease pressure can also



**Flowers affected by disease**

increase as the plants grow and become difficult to cover with protectant fungicides.

**6 Apply products with multiple mode of action groups.** It is recommended to apply products with different modes of action, either as a mixture or in rotation. If applying as a mixture ensure that fungicides are compatible. Fungicide incompatibility can occur for a variety of reasons that leads to a reduction in efficacy or an increase in phytotoxicity (see resources in further reading). There are an increasing number of products sold as a mixture of fungicides with multiple modes of action, often including a protectant and eradicator or curative product.

**7 Alternate fungicides with different modes of action.** This approach reduces the total number of applications of any

given fungicide and therefore will reduce the risk of inducing fungicide resistance. As indicated above, follow all fungicide resistance management strategies printed on the label, which may include limited sequential applications.

**8 Maintain the dose stated on the label.** Doses below the recommended rate may be ineffective at managing the pathogen, even at low pest pressure and therefore require more fungicide applications. Experimental and theoretical data on the effect of fungicide dosage on the risk of inducing fungicide resistance is complicated and not well understood. **The fungicide application did not work, is that resistance?**

Field observation is not conclusive proof. It may be a spray coverage or calibration problem, poor water quality, extreme weather conditions





Regardless of whether the product is a protectant, curative or eradicant fungicide, they are most effective when used early, before symptoms actually appear or when symptoms are very minor.

or a number of other factors. Testing for fungicide resistance requires detailed laboratory screening, which can be time consuming and expensive.

#### Conclusion

Fungicides are useful products that can play an important role in growing healthy nursery stock. Two Key points:

(1) They prevent the build-up of resistant individuals in the population by not overusing fungicides with a similar mode of action.

(2) Use an integrated strategy. Reduce the fungal population with cultural practices and avoid having a series of close plantings with the same crop.

Be targeted in fungicide use, choosing the best products to achieve the desired result. Remember that fungicides never truly eradicate pathogens; disease symptoms may disappear but the pathogen is likely to

be present and able to re-emerge under favourable conditions.

#### Why are fungicides increasingly expensive?

New generation fungicides may cost \$250 million and may take over a decade or more to develop. This cost and investment into a new product is reflected in the retail price. As such, replacement of a fungicide lost to resistance cannot be guaranteed; everyone must do their part to reduce the incidence of fungicide resistance.

Many protectant products have multiple modes of action, which decreases the risk of inducing fungicide resistance. Repeated applications will be required leading up to and during periods of high disease pressure.

# World Trade Organization Focuses On Floriculture Trade

*“Rules-based trade’ ensures that flower trade runs smoothly”*

“Trade rules tend to be taken for granted. However, without rules, there would be mayhem. A trading system that is based on rules helps ensure that flower trade flows as smoothly, predictably, and freely as possible.” The World Trade Organization recently posted a video in which they focus on rules-based trade in the floriculture industry. In her recent LinkedIn post, Sylvie Mamias, Secretary General of the international floriculture trade association Union Fleurs, discusses the importance of WTO’s focus



Bernard Kuiten

on floriculture trade.

### Let’s talk trade

“How inspiring to see that the World Trade

Organization chose flowers to illustrate its latest LetsTalkTrade video episode and explain the concept of ‘rules-based trade’ with a concrete example,” says Mamias. “A clear and useful reminder that a global trading system based on rules helps ensure that international trade flows as smoothly,

predictably, transparently, and freely as possible. It also guarantees fairness, stability, and non-discrimination.”

In the video, Bernard Kuiten and Sainabou Taal explain that not everybody likes rules, but they are needed to guarantee fairness. “WTO members have to treat each other equally when they trade. That means



that Kenyan roses cannot be treated any differently from roses from Holland, for example. Simply put, companies cannot discriminate against foreign flowers in their domestic market.” Without the certainty of rules, tariffs and regulations could change from one day to another, and flower

businesses could be in trouble.

### Rules are essential

According to Mamias, trade rules fulfill an essential role, as they ensure that international value-chains such as flowers can continue to prosper and offer valuable opportunities and socio-economic prospects to the various countries around

the world (small and big; either developed, emerging, or developing economies) involved in providing flowers to



Sainabou Taal

destination markets and in bringing delight and well-being to millions of consumers around the world. “Those rules

should never be taken for granted and, while in the background and not always very visible to operators, they should be recognized, valued, and promoted as an essential component of any responsible and sustainable value-chain.”



# 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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# Which Pathogens Should You Worry About in Your Water?

When it comes to talking about disease-related issues in greenhouse crops, one point of confusion is often WHICH pathogens CAN be transmitted by water. Some are obvious – we all know Pythium is water-borne. But what about other culprits, like Fusarium or Erwinia? Should you worry about these in your recirculating water?

## “Water-borne” fungi

You may have heard the term “water-borne” when discussing irrigation water and disease risks from Fungi, but aren’t sure exactly

which pathogens it includes.

Generally, there are two types of pathogens we can consider as “water borne” fungi. The first – and most classic definition – are pathogens that are actually motile in water (i.e. produce swimming structures). This includes Pythium and Phytophthora. Both of these diseases are technically classified as “water molds”, being more closely related to algae than to fungi, though they look very much like fungi. They are well adapted to an aquatic environment and can live where irrigation water is stored (cisterns, ponds) for long periods.

Then there are those pathogens that survive for short periods in water and are carried by flow with water and debris. We can also see these water-borne pathogens since they can

theoretically carry disease from a single infected bench throughout your whole facility via your irrigation system.

Fusarium, Thielaviopsis, Alternaria, Botrytis, Ascochyta, Rhizoctonia, and Verticillium technically all fall into this second category. Species of Fusarium carried in irrigation water have been conclusively linked to outbreaks of root rots. However, direct links between these other pathogens in irrigation water and disease outbreaks still need to be made in greenhouses – but we shouldn’t rule them out. Other routes – such as splashing via overhead watering, dirty benches or ground covers, and vectoring by tools, shoreflies and fungus gnats – may be more likely transmission sources.

Purely foliar diseases – like powdery or downy mildew – have not been reported from irrigation water, and this is not a known transmission source for these pathogens. Controlling humidity in your greenhouse through proper ventilation, however, is key to preventing and controlling these diseases.

## Bacteria in irrigation water

Bacteria are another important pathogen type to consider when it comes to your water. Specifically, Erwinia ( now known as Pectobacterium carotovum ), Xanthomonas and Ralstonia have been shown to infect ornamental greenhouse crops via irrigation water. Some bacteria can remain biologically active in water for over a month if the water is untreated.

Further, bacteria are likely to build up and form what’s known as a biofilm in your pipes and irrigation lines. This can clog





emitters, and created losses due to wilting, plant stress, and extra labour.

**What about viruses?**

Most viruses need a mechanical form of transmission to get into the plant. Examples are the piercing mouthparts of vectoring insects (e.g. thrips or aphids), or pruning equipment.

But surprisingly, some viruses have been shown to be spread in recirculating nutrient solutions in

to prevent the spread of the virus via all possible transmission routes. Plant viruses (such as INSV, pictured here, in Echinacea) can remain viable in recycled water. However, this is an uncommon route of transmission.

**When to suspect your irrigation water is to blame**

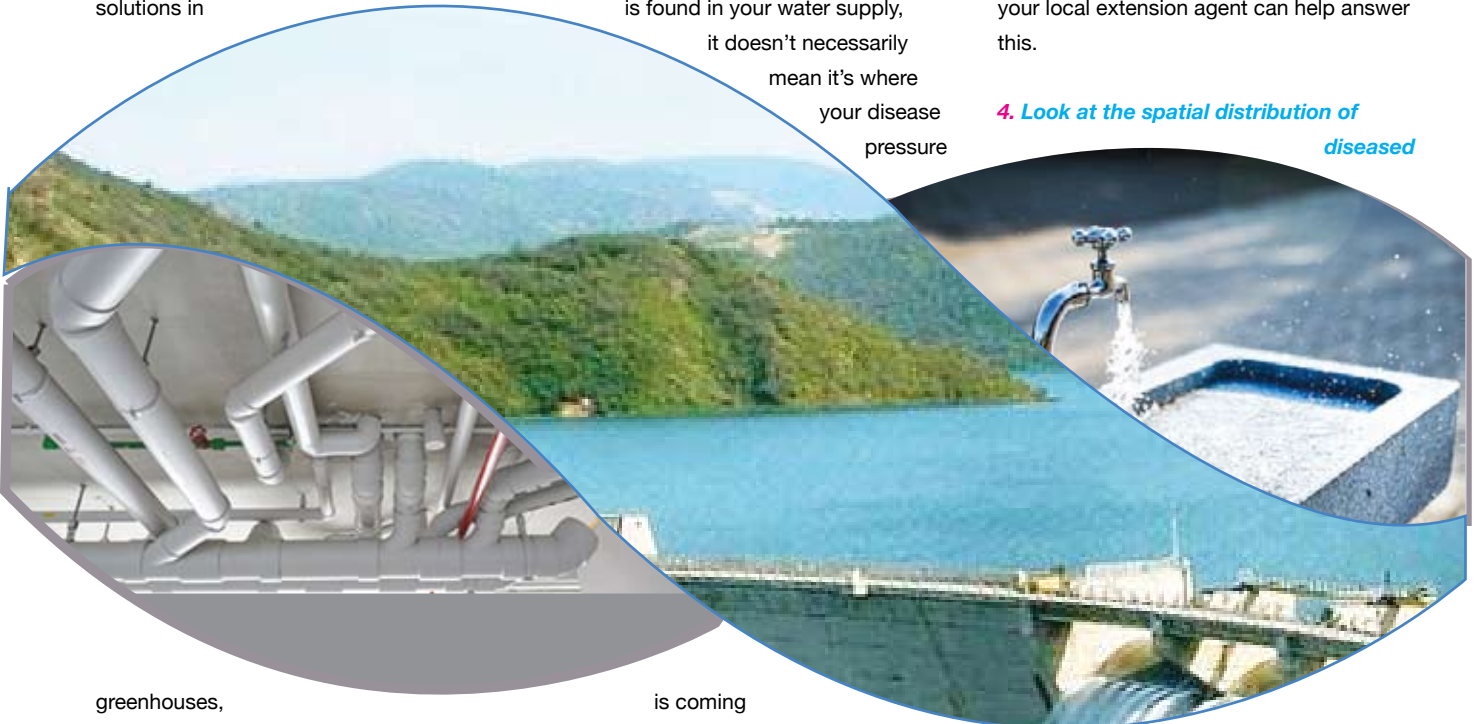
As with anything, we have to remember that correlation does not necessarily mean causation. Just because a pathogen is found in your water supply, it doesn't necessarily mean it's where your disease pressure

detection limit for a test like DNA analysis, it is unlikely to be at sufficient pressure to cause disease. (However, just because it IS present, doesn't mean it's DEFINITELY causing the disease!

**3. Has the identified pathogen been reported to be spread by irrigation AND be able to infect the crop in question?**

If only ONE of these is true, then irrigation water might NOT be the source of your outbreak. Experience, growing guides and your local extension agent can help answer this.

**4. Look at the spatial distribution of diseased**



greenhouses, infecting the plants via sensitive root tissue without an insect vector. Examples include the highly contagious Pelargonium flower break virus and tomato spotted wilt virus (TSWV). However, high virus loads are needed for this to be a source of transmission.

Generally, managing insect vectors – and your employees – is more important to control the spread of viruses than managing your irrigation water. However, plants exhibiting viral symptoms should be disposed off as soon as possible,

is coming from. Here are some things to ask yourself when a disease issue arises (adapted from Hong-pathogensinwater):

**1. What part of the plant is affected?**

If it is a root or stem rot, then irrigation water could be to blame if you are sub-irrigating. Overhead watering? Then bacterial leaf spots could also be a result of contaminated water.

**2. Can a pathogen be detected in water sources?**

If the level of the pathogen is below the

plants. If only a portion of the crop is irrigated from the suspect water supply, then areas irrigated from different sources should exhibit differences in the number and distribution pattern of diseased plants. If the suspect water is applied over the entire area, such as by ebb-and-flow irrigation of benches, flood floors or overhead sprinkler irrigation, expect a large amount of plants to be affected with a somewhat even distribution (rather than small foci of diseased plants).

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\* According to a study by Innovative Fresh.



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**CHRYSA**



# Breeding Natural Enemies to Control Pests

**I**nsect monitoring forms an important part of integrated pest management programmes. It is crucial to identify pests accurately so that appropriate control measures can be taken. Insect traps are one way of observing the prevalence of insects.

Agricultural research and farming practices are increasingly driven by recognition of the need for sustainable agriculture and lower environmental impact.

Lately, we have main facilities, that boast of the latest technology and a local research and development team that enables them to address the specific needs of its clients. Their mission is to produce integrated and sustainable solutions for pest management that contribute to healthier and more productive agricultural systems. The facilities focus on the production and application of beneficial organisms used in biological pest control and IPM programmes. Insects will be mass-produced to support the IPM programmes both locally and internationally.

Biological pest control uses living organisms to suppress pest densities, and is centred on using one type of organism, the 'natural enemies', to control another, the pest species.

Pests such as insects, mites, weeds and plant diseases are thus controlled via predation, parasitism, herbivory or other natural mechanisms.

### Restoring the balance

The purpose of biological control is to restore the balance between pests and their natural enemies to keep the former, as well as diseases, at acceptable levels. The aim, however, is not to eradicate them altogether, as they also have a role to play in nature.

In most cases, farmers incorporate natural enemies into their IPM programmes. IPM is a system of managing pests in agricultural crops through a combination of biological, cultural, physical and chemical control methods.

In many instances, the overuse of chemical pesticides has led to problems such as pesticide resistance, outbreaks of previously suppressed pests, as well as environmental contamination. IPM evolved as a way of addressing these problems.

IPM systems aim to reduce the use of non-selective chemicals and produce healthy crops with minimal impact on the environment and human health. Some of the major components of IPM programmes are:

- The accurate identification of pests;
- Regular and continual monitoring of

pests and the damage they cause to crops;

- Determining threshold levels in order to know when action needs to be taken;
- Prevention;
- The implementation of a combination of the biological, cultural, physical, and chemical control methods; and
- The evaluation of the effect of pest management.

### Breeding natural enemies.

To breed the natural enemies [of plant pests], we have to breed their prey. At this stage, let us take an example of mealybugs (family Pseudococcidae), an economically important pests of ornamentals, citrus, grape vines, mangoes etc. Mealybugs are scaled, soft-bodied insects that are extremely difficult to control with chemicals. The use of natural enemies is considered the best alternative means of control. All of the natural enemies produced occur naturally, and are therefore adapted to most regions.

Most facilities breed four natural enemies of mealybugs, giving each a brand name. Each species targets a different life stage of the pest, and in some instances can be used to complement one another to control different species of mealybug. However, some are host-specific and only target certain mealybug species.



The ladybird [species] Crypto-Tec (*Cryptolaemus montrouzieri*) targets all mealybug stages and most mealybug species, and is compatible with a wide range of crops, from citrus to pome fruit and even sweet peppers. Another predatory beetle produced, Neph-Tec (*Nephus kamburovi*), however, is a tiny beetle that feeds only on mealybug eggs and mealybugs in the early life stage.

In addition to these two predatory beetles, we also have two parasitic wasps, Ana-Tec (*Anagyrus vladimiri*) and Cocci-Tec (*Coccidoxenoides perminutus*), which are used simultaneously in situations where the citrus mealybug is the dominant species, as these two wasps complement each other by targeting different life stages of the mealybug.

**Effective and sustainable**

A typical biological control programme to manage a light infestation of citrus mealybugs will entail the simultaneous release of about 1 000 Ana-Tec and 15 000 Cocci-Tec wasps per hectare. Each situation is different, and the ‘dosages’ are dependent on many factors, such as region, climate, mealybug species,

infestation level, and the lifespan of the pest at that particular moment.

The breeding quantities of each natural enemy for a particular season are based on planned releases, as well as historical data of past releases, and weather conditions will determine when the releases take place.

Normally, the predators are not released during cold season in areas known for very low temperatures, as their growth and activity slow down under these conditions. The effectiveness of using natural enemies to control pests is impossible to ignore,

and therefore [these natural enemies] have become an integral part of IPM programmes throughout the world.

Consumers are increasingly demanding more sustainably produced products, and farmers themselves are becoming increasingly conscious of the pest control methods they apply on their farms. Therefore, more and more are starting to implement IPM systems on their lands. It is not gainsaying that biological pest control is the cornerstone of their IPM strategy.

Some farmers have introduced biological pest control in fruit production as part of our strategy to reduce the use and impact of pesticides on the environment and biodiversity. Using available biodiversity to curb pests is an exact science, and to this end, R&D companies will play an important role in facilitating our IPM programmes that focus on the long-term prevention and management of pests.

“We see ourselves as custodians of nature and strive to produce in an environmentally sustainable and responsible manner. Using nature’s natural order to restore balance in our produce is sustainable and ultimately beneficial for fruit production and agriculture in general, says a grower.”

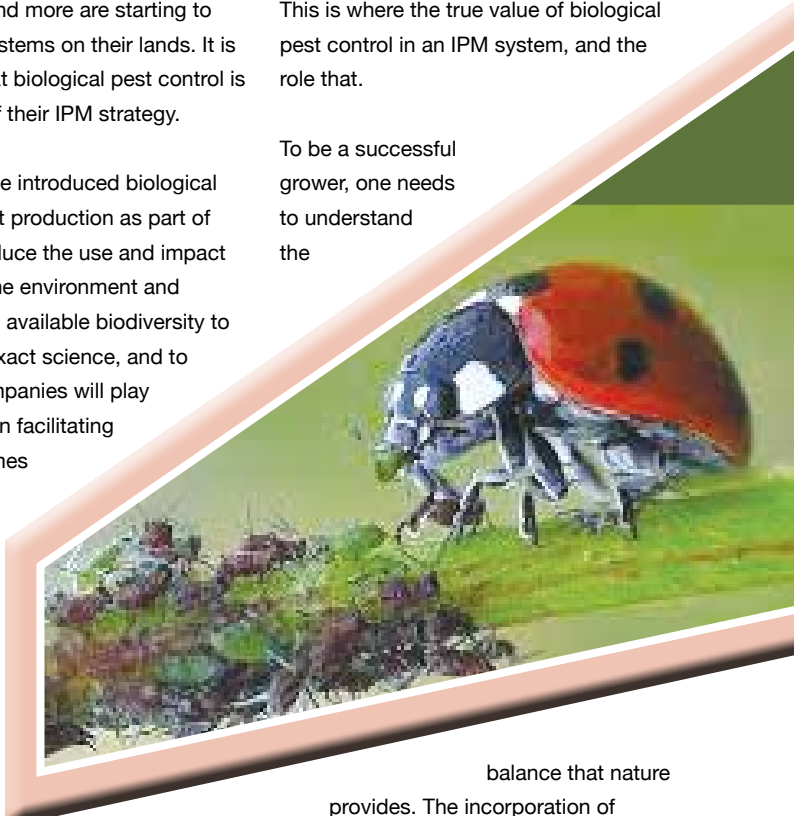
**A change of approach**

In the past, farmers who produced fruit in monoculture systems relied heavily on chemicals only to produce quality pest- and disease-free fruit. Today, it is widely

accepted that, in terms of sustainability, this is not a good option.

While fruit growers still employ chemical control measures, about three to four months prior to the harvesting season they need to find alternative ways to control pests and diseases due to the maximum residue limits placed on chemical usage. This is where the true value of biological pest control in an IPM system, and the role that.

To be a successful grower, one needs to understand the



balance that nature provides. The incorporation of biological control measures remains a challenge, especially without a continual supply of beneficial insect.

Growers need to plan the chemical interventions applied carefully and timeously to get the control required with as little disruption of the natural balance as possible. When the risk period for damage ceases, top up with beneficial complex with biological insects to sustain through the remainder of the season.



# Fertigation: All-The-Rage Agricultural Technology

manual or fully automated control.

### What Is Fertigation?

In fertigation, liquid fertilizers are delivered to plants with irrigation. Compared to traditional fertilization methods, the fertigation technique proves to be more efficient. In particular, benefits of fertigation include:

- saving costs on reduced fertilizer amounts;
- eliminating nature pollution with decreased

Fertigation systems differ by several parameters:

- Size and scale of applications: a large-scale fertigation system is used at a big enterprise. Correspondingly, small-scale fertigation systems are suitable for smaller farms or greenhouses.
- Management: there are manual and automated fertigation control systems. Timers can be integrated into the irrigation system, enabling fertigation at the established times.
- Irrigation methods: flood irrigation, nozzle and head sprinkling, drip fertigation.

### Accuracy Of Nutrients Application In Fertigation

A significant advantage of fertigation is the liquid form of nutrients distribution. Thus, plants can absorb them immediately after administration, which enhances their availability and efficiency. Root fertigation allows optimal nutrient supplies to the root zone, with minimum losses. It essentially reduces runoffs and wastes, especially due to downpours or flooding.

Fertigation scheduling depends on the crop needs within required time frameworks and may be performed daily, weekly, etc., according to the nutrient management plan. Besides, for example, in the case of fertigation through drip irrigation, the absence of machinery soil disturbance during fertilizer applications prevents earth compaction.

Most fertigation systems are equipped with sensors to measure pH-levels and electric conductivity. This way, farmers can determine necessary fertilizer rates. Then, they can set the fertigation and irrigation system injectors correspondingly.

Since fertigation is not the only source

- chemical applications;
- controlling administered rates;
- tackling soil erosion;
- optimizing water consumption;
- preventing fertilizer leakage due to heavy rainfalls or water supply;
- promoting rapid root growth;
- affecting soil microbial biomass.

The most commonly used water-soluble fertilizers for fertigation comprise ammonium nitrate, urea ammonium nitrate, calcium nitrate, ammonium thiosulfate, potassium chloride, potassium sulfate, potassium nitrate, phosphoric acid, sulfuric acid, etc. Apart from supplying nutrients proper, some fertilizers can perform acidulating functions and boost soil properties.

Thiobacillus bacteria in ammonium thiosulfate participate in the process of lime dissolving and turning it into gypsum, which improves the soil structure.

### How Fertigation System Works

Fertigation technology suggests sprinkling fertilizers into the irrigation system from reservoirs with water-soluble fertilizers. Typically, it is done with injectors and a pressure-controlled valve.

**F**ertigation is a widely used farming practice. The fertigation technique allows growers to save time, resources, and efforts by completing two events at a time: *fertilization and irrigation*. Customization of modern fertigation systems and innovative satellite-based software enable pinpoint variable rate fertilizer (VRF) applications. The most efficient method is drip fertigation that reduces inputs and delivers nutrients to the root zone. The technology is suitable for farm enterprises of any size since there are large and small-scale fertigation systems, with



of nutrients, it should be summed up to the total amount of planned nutrient supply when calculating the application rate.

### Distribution Of Nutrients With Fertigation Implementation

As fertilizers are liquid, their delivery and distribution correlate with wetting patterns. In other words, nutrients will transfer to the areas within water reach. The most typical technique is drip fertigation. The optimal use of resources is achieved with root zone fertigation that provides moisture right at the plant root.

Typically, drip irrigation wetting patterns are oval or hemispherical, either on the soil surface or at the emitter level under it (depending on if the tape runs on or below the surface). The highest amount of water (and correspondingly, nutrients) will be around the emitter and under it. Horizontal spreading of moisture is

### What To Consider For Successful Fertigation

As mentioned above, fertigation suggests delivering liquid fertilizers via an irrigation system. Yet, merely adding them is not enough. Agronomists take several fundamental properties into account, including solubility, compatibility, acidity, and salinity (osmotic pressure).

#### Solubility

First of all, the choice of fertilizers depends on their solubility in water. So, the suitable options are:

- Solid ones that can properly dissolve;
- Liquid ones that are already dissolved.

Different fertilizer types have different solubility capacities. What is more, the degree and speed of solubility also relate to temperature. So, it matters if nutrients can dissolve under

**In fertigation, liquid fertilizers are delivered to plants with irrigation. Compared to traditional fertilization methods, the fertigation technique proves to be more efficient.**

advance and storing them. Precipitation is characteristic of monoammonium phosphate, urea phosphate, or phosphoric acid. Ammonium nitrate, potassium nitrate, urea, and ammonium phosphate refer to quick water-soluble fertilizers.

Typically, the higher the temperature, the higher the solubility is. For example, the solubility of ammonium nitrate rises more than twice when comparing the temperatures of 0°C and 30°C – from 1183 to 2420 g/L correspondingly. It means that a greater amount of nutrients will dissolve in the same amount of water.

However, there is another significant aspect to bear in mind. Solutions for fertigation systems can be endothermic or exothermic, i.e., the solution temperature either decreases or increases in the process of dissolution. Generally, most nitrogen-based fertilizers take heat from the water, so the solution temperature drops. Consequently, the preparation process will take more time, and more time will mean cooler liquid and reduction of estimated concentration.

#### Compatibility

When it comes to matching several components for fertigation, it is essential whether they are compatible or not. The basic rules are as follows:



conditioned by the soil properties, irrigation rate, and duration respective to plant needs. Another aspect that influences nutrient distribution is their type and the ability to adsorb to soil components. For example, nitrates and sulfates do not adhere to soil particles, while potassium and phosphorus do. In particular, phosphorus binds with calcium or aluminum, and positively charged potassium reacts with negatively charged clay.

the current temperature in the field or not. Thus, the season should be taken into consideration as well since the solubility rate will differ.

Besides, some fertilizers may precipitate out of solution when added in high concentrations to hard water or when the temperature drops, e.g., in a cooler season or cold nights. This property counts when preparing solutions in

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### Sprinkler System

- Prepare separate solutions and store them in separate reservoirs if they may enter an undesirable reaction.
- Do not combine phosphorus or sulfur with calcium.
- Do not add chelates to non-chelates.
- Isolate chelates from acids because they break in acidic pH.

The basic rules to mix fertilizers are to avoid precipitations and reduction of solubility due to chemical reactivity.

#### Acidity

Solution acidity causes corrosion, which deteriorates metal reservoirs, and irrigation system parts. This parameter is assessed as the pH level, and neither too high nor too low is good. Acid solutions have high corrosivity, while alkaline liquids represent the risk of precipitation. Chloride-based chemicals are also notorious for corrosive properties.

#### Fertilizers can decrease or increase the solution pH, for example:

- Diammonium phosphate would create a higher pH than mono-ammonium phosphate.
- Nitric acid would lower the pH of the solution even at relatively low concentrations.

Besides, agronomists consider the soil reaction to fertigation. In particular, muriate of potash or potassium sulfate gives a neutral reaction. With calcium nitrate or potassium nitrate, it is basic. Ammonium nitrate, urea, ammonium sulfate, monoammonium phosphate, diammonium phosphate produce an acidic reaction. Phosphoric acid applications cause the strongest soil acidity.

#### Osmotic Pressure

Typically, irrigation water is to certain degree saline, and adding salt-containing fertilizers contributes to salinity even more. Salinity relates to osmotic pressure. Negative osmotic potential complicates water absorption by plant roots, which results in a reduction of yield. Crops suffer from osmotic stress and cannot use moisture even when it is available in the soil because it flows from less saline areas to more saline ones. Plants spend more energy to absorb water and nutrients from fertigation, and if osmotic stress



is critical, they die. For this reason, administered fertilizers should produce as low osmotic pressure as possible.

As a rule, the salinity potential of fertilizers is not measured. It is assessed by electric conductivity and its correlation to osmotic pressure. Electric conductivity and pH are computed and then compared. It is specific for each chemical substance. For example, ammonium sulfate would generate a higher osmotic pressure in a solution (per amount of total nutrient applied) than ammonium nitrate.

#### Fertigation Scheduling

Plants require different nutrient volumes at different development stages. Either too early or too late applications almost turn into waste due to runoffs or volatilization. This particularly refers to nitrates that are not retained in the soil. As for phosphorus, it may leak too, though in many cases, about 50% of this fertilizer is administered before planting.

Fertigation allows agronomists to supply nutrients to crops in the right amount and at the right time, thus proving to be the most efficient method. It is even more beneficial to deliver nutrients to the root zone. This way, fertigation promotes root growth.

Furthermore, smaller fertilizer amounts save costs to farmers and prevent unjustified soil salinization due to saline water or when fertilizers salt out.

It also makes sense to apply nutrients

slightly before the time the crop needs them to secure successful growth. Typically, the most intensive fertilization is required during plant growth and is reduced or completely stopped at the harvesting stage. Tracing weekly progress, farmers can schedule fertigation events.

#### Fertigation Compatibility With Irrigation Systems

There exist several options to carry fertigation out like surface and pressurized or non-pressurized irrigation, each of which contributes to crop production in its specific way.

#### Surface Irrigation

Surface irrigation is the most common type of water saturation, applied to 90% of all irrigated lands. However, it might not be a cost-efficient method as only 30-70% of water reaches the active root zone.

Typically, fertigation systems are not incorporated into surface irrigation since fertilizers are usually supplied via designated canals in established volumes. The equipment includes reservoirs with valves or openings for liquid and solid fertilizers correspondingly. It differs by

operation complexity (from manual to fully automatic).

Fertigation with surface irrigation is not always efficient due to the loss of nutrients in tailwaters or seeping. This particularly refers to nitrogen-based fertilizers. However, the method practitioners state that high yields do justify the cost inputs even despite nutrient losses. The technique is suitable for zero slope and surge irrigation.

**Pressurized Irrigation**

As the name reveals, nutrients run through the system in this irrigation type thanks to the pressure differential. However, with anhydrous ammonia, no pressure is required since the solution possesses it naturally.

The force applied depends on the system type: it is stronger with sprinkler systems and weaker with drip ones. When using aggressive fertilizers, agronomists consider their corrosive impact on metal equipment parts as well as canopy burns.

**The drip fertigation system is the most efficient option as it:**

- brings nutrients directly to the root zone, which optimizes water and fertilizer use;
- requires less pressure compared to other techniques;
- allows different automation settings.

**Site-Specific Fertigation With Crop Monitoring**

Modern fertigation systems have a wide array of customization features. This benefit enables farmers to step aside from uniform field treatment because, typically,

different field zones have different nutrition needs. Generally, fertilizer rates depend on multiple factors:

- type of crop,
- growth stage,
- soil type,
- fertilizer grade,
- solution concentration,
- soil moisture,
- soil temperature,
- osmotic potential,
- fertigation effect on soil microbial biomass (microbial action).

Crop Monitoring with its zoning feature enables Variable Rate Fertilizer (VRF) application.

Farmers can identify zones in each field and manually set an appropriate amount of fertilizer for every zone (dividing a field into up to seven vegetation zones). Vegetation maps give actionable insights based on recent satellite data. Crop Monitoring shows the field productivity (or lack of productivity) in different zones with different colors. Thus, green highlights the areas with the healthiest vegetation. Red reveals the least healthy crops, summoning for immediate attention.

The possible deviance reason may be a lack of nutrition. So, green areas require a comparatively low fertilizer rate while red ones require the biggest dose. Furthermore, vegetation and productivity maps facilitate fertilizer inputs calculations, depending on the field needs. Growers enter fertilizer volumes

for each zone and get the computed total amount for the field.

Correct fertilizer distribution essentially depends on weather conditions (air temperature, precipitation, wind speed, etc.). In sprinkler fertigation systems, winds may move the mist in the wrong direction, and high concentrations may negatively impact the crops (e.g., burn leaves or fruits). Crop Monitoring offers precision weather forecasts for up to fourteen days ahead. Being armed with wind speed information, soil fertility specialists can plan applications more efficiently, omitting wastes and unintentional crop leaves and fruit damage.

Thus, satellite-retrieved data from the Crop Monitoring software makes fertigation more accurate. It is a reliable assistant of every supporter of precision agriculture techniques.



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# Shalimar Flowers: Burgeoning Two Decades On...!

By Mary Mwende Mbithi

On the shores of Lake Naivasha, off North Lake Road in Kasarani area of Naivasha in Nakuru County lies a magnificent, well maintained farm with landmark, conspicuous greenhouses. Shalimar Flower Farm, a hotbed of horticulture thriving in Avocado and cut-flower growing.

## Inception and Production

The farm was started in 2002 on a 350 acre piece of land. It is one of the four farms enshrined under the umbrella of Shalimar Flowers (K.) Limited, (previously East Africa Growers). Having expanded from the initial 30 hectares, it currently, runs on

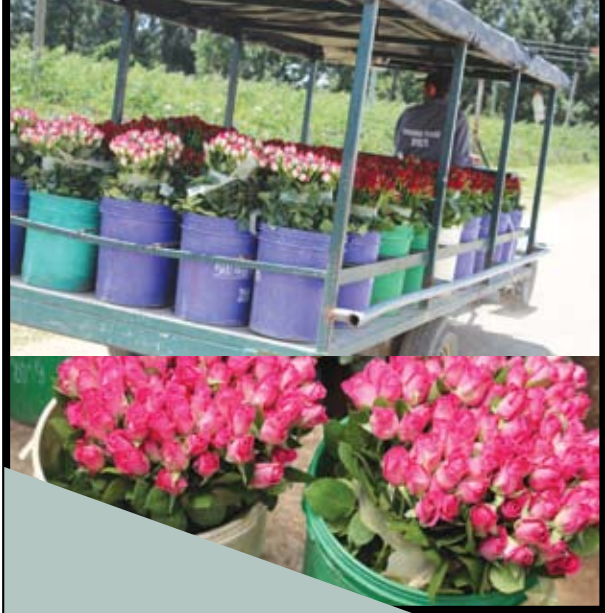
34 hectares massive piece of land. Shalimar Flowers (K.) Limited grows over 40 varieties of Roses mainly the T-Hybrid, Premium and Spray intermediate roses. ( in different farms ) They have incorporated the hydroponics system in their production. They also grow other flowers such as Gypsophilla, Solidago, Lipiedium, Chrysanthemum, Eucalyptus and Gerbera. They are also preparing to introduce Astroemeria and Hypericum flowers in their farms.



Mr Natarajan



Shalimar Flowers (K.) Ltd, aspires to expand on both variety and land. They are working on growing more flower varieties and creating additional 15 hectares of land in future.



**Affiliation of Shalimar farm to other farms**

Shalimar farm has three sister-farms under the Shalimar Flowers (K.) Limited umbrella. They are; Shalimar-Mahee in Ol-Kalau, Shalimar - Mwanzi in Rumuruti and Shalimar- Kabuku in Thika. These three farms occupy an extensive chunk of land of about 20 hectares per farm in their respective regions.

**Choice of Locality**

According to the Group General Manager of Shalimar Flowers (K) Ltd., Mr. Natarajan, Many considerations were explored in setting up Shalimar farms. Among them were the climatic conditions, water, availability of land, manpower and accessibility.

“For instance Shalimar farm is in Naivasha, Rift Valley region. In this area, the volcanic soils in Rift Valley which resulted from the rift valley formation a million years ago are said to be fertile. There is also availability of Fresh water from the lake. The proximity of

Naivasha to the equator means sunny days and cool nights that give an optimal climate for flowers to flourish.” Said Mr. Natarajan.

**Human Resource**

Shalimar Flowers (K.) Limited has a workforce of over 2000 employees. The General Manager, Mr. Natarajan sits at the helm of the four farms (Shalimar Flowers (K.) Limited). There are four farm managers stationed at respective farms under the Shalimar group as follows; Mr. Ram Mwanzi Farm, Mr. Kirthan Mahee Farm, Mr. Mohan Raj Kabuku Farm and Mr. Dinkar Wandhekar Shalimar farm.

The others in the leadership positions are the, Production managers, Supervisors among others. There are Human Resource offices in each farm with the group HR based in Nairobi.

**Pests and diseases control**

To keep their flowers pest-free, Shalimar farms have covered their greenhouses with insect proof nets on sides and vents. They also manage damaged structures to prevent insects and pests from outside. There is also the utilization of the biological control to mitigate the pests and diseases. Scouting and staff training is also incorporated for early identification of diseases and pests.

**Post-harvesting**

Shalimar Farm does flower processing on site after harvesting. They have internal pack houses and cold rooms which enable them to package the flowers into desired specifications (such as bouquets) for the end consumer. This means they export ready to use products.

**Market and customer satisfaction**

Shalimar Flowers (K.) Ltd exports their flowers to the European Union. They are 100% direct market with all their flowers being sold directly



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**Cobra Security Company Ltd takes this opportunity to congratulate Shalimar Flowers on their 20th Anniversary. We are proud to be associated with you.**

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to supermarkets. The group has constantly worked hard to maintain the quality of their flowers and a consistent supply chain in order to fulfill their customer needs.

Challenges

Farm inputs are getting expensive day by day. This together with hiked electricity charges are proving a thorn in the eye of the flower industry and so does shalimar. In addition, government can also hasten VAT refunds.

Environmental Sustainability

Waste management is categorized into two; liquid and hard stuff. On the liquid waste, Shalimar is focused on ensuring ecologically sustainable flower farming. Fertilizer leaching is minimal thus less pollution to the environment. They recycle their water with the clean water released back to the farm. Shalimar Flowers uses mostly ecofriendly chemicals leading to

Shalimar Farm does flower processing on site after harvesting. They have internal pack houses and cold rooms which enable them to package the flowers into desired specifications (such as bouquets) for the end consumer.

minimal pollution of the environment.

Management of the hard stuff is superb in that there is utmost segregation of both the biodegradable and non-biodegradable waste. The biodegradable is composted while the non-biodegradable is collected by an outsourced waste collector for correct disposal. Tree planting is also exercised with the farm.

Corporate Social Responsibility (CSR) Just like Janie Lewis, an author once wrote; 'we have a social responsibility, a constitutional opportunity and a moral obligation to help others.' The emphasis placed by more and more companies on corporate social responsibility symbolizes the recognition that prosperity is best achieved in an inclusive society. Shalimar Flowers (K.) Ltd is actively involved in CSR.

They are supporting school feeding programs in the region, availing social amenities like a playground they bought for a neighbouring school- St. Andrew's High School, cleaning hospitals, connecting clean piped water to the community as well as harvesting rain water that is usually released for use to the community.





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De Ruiter takes this opportunity to extend *sincere congratulations on the 20th Anniversary of Shalimar Flowers.* Shalimar has established its brand for the consistent supply of quality roses, both in retail & wholesale segments, worldwide. You can be very proud of the growth you have achieved over all these years.

Employees' welfare

The farm prides itself as being Global Gap, Mps, ETI and Fair Trade certified. Shalimar Flowers (K.) Ltd treats its employees with utmost dignity in order to maintain and improve their output.

Through the Fair trade, the farm





gives bursaries to its employees' school going children. Workers are also supported in paying college fees to accomplish their dreams. They are also provided with housing facilities, registered in the company Sacco and given access to low interest loans.

the situation became a norm and as the other farms were readjusting, so was Shalimar. So far the industry is thriving uninterrupted amidst the pandemic.

#### Covid-19 and the flower industry

Shalimar Flowers (K.) Ltd was among the many companies that experienced the biting jaw of the pandemic. On the early stages of its onset, the entire flower industry was shaken. Shalimar was prompted to adjust to the new normal. This saw the downsizing of man-power and cutting on production costs. After a while

#### Future prospects

Shalimar Flowers (K.) Ltd, aspires to expand on both variety and hectareage. They are working on growing more flower varieties and creating additional 15 hectares in future. It is the will and wish of every organization to endeavor to do their best, and Shalimar is no exception. "Customer satisfaction remains a key area of focus for

the farm." Concluded Mr. Natarajan.

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Greenspan Agritech, takes this opportunity to congratulate *Shalimar Flowers* on their 20th Anniversary. We are proud to be your partner in growth.

## *Sylvie Mamias on the international Union Fleurs association*



Giving  
floriculture trade  
the recognition  
it deserves

“Our total membership represents about 80% of the global floriculture trade, so we have a good representation of the international market of cut flowers and potted plants. In our industry, it is important to have a collective voice that gives visibility to important topics, such as market access and sustainability,” explains Sylvie Mamias, Secretary General of Union Fleurs. The international floriculture trade association is based in Brussels, as one of its key roles is to represent the common interests of its members towards the EU institutions. “The impact of the start of the pandemic is a good illustration of our work. When such challenges arise, we are able to get the attention of governments and policymakers to make them aware of the specificities of this industry and channel support.” She adds

### Market access

Mamias explains that one of the top priorities for the association is to promote seamless markets and trade and remove trade barriers along the supply chain. “We aim to facilitate this from production to consumption, with all the steps in between. Therefore, anything that can impact the flow of products along the chain is something that we try to bring attention to towards people with influence.” Over the past 60 years, Union Fleurs has successfully advocated the interests of the floricultural trade on these topics and influenced policy-making, resulting in many achievements that nowadays benefit the floricultural trade in their daily operations, such as phytosanitary requirements, duty-free tariffs, and market access conditions.

Concerning market access, there has been a number of important developments over the years. “Since last year, there has been growing pressure on logistics, as a result of the lack of transportation. However, there are also more structural and longer-term developments, such as the sustainability of transportation. How can we ensure that flowers can continue reaching markets, but in a more sustainable way? Diversifying means of transportation and utilizing more sea freight, for example, would significantly reduce carbon emissions. Concerning these longer-term issues, we as an association can have more of an influence, and we need to think together to promote solutions that benefit everyone along the supply

chain.”

**A growing protectionist agenda**

According to Mamias, the global trade of flowers has traditionally functioned on free trade. However, she explains that there is a growing agenda for protectionist policies and local sourcing. “Such a development would result in a reduction of the global trade and would ultimately impact the smooth functioning of the supply chain, the sourcing offer, and ultimately the choice of products for final consumers all year-round. With highly perishable products such as flowers and plants, it is essential to ensure optimal operating conditions and a regulatory environment that facilitates the movement of products. Therefore, we are very vocal in defending the interests of our members in these areas. We need to ensure that borders will remain open and that the international trade will continue in optimal conditions to support the continued growth of the floriculture industry.”

Similarly, Brexit has been a recent topic of high relevance for the association. “Brexit has created new barriers to reach the UK market,

which has created a number of challenges for companies that operate on that market. The plant passports and phytosanitary certificates that are now necessary, for example, can make their export more expensive and challenging. Of course, we do not want to fight against the regulations regarding pests, as the trade needs to ensure that they are sourcing and supplying safe products that are free of pests, but the requirements for additional documentation need to be optimized to limit red-tape and extra costs on operators. Therefore, we have been supporting the development of electronic systems at the international level to be used for phytosanitary certificates for many years. This will create much more efficiency for companies.”

**A crossroad**

“As an international association, we have a collective voice with which we can achieve much more than a single company or country could. It is ultimately for the benefit of the whole industry that we are working together,” says

Mamias, and the association’s work is not done yet any time soon. “If we look ahead, the industry is at a bit of a crossroad. On the one hand, there is a growing interest of consumers in our products, creating great opportunities. Yet at the same time, there is a number of challenges on the way, particularly in the sustainability area. As these are issues that the industry needs to address, we will continue our efforts together with our membership and with our extended network in the international floriculture industry. To move forward, the industry needs to anticipate and recognize its collective challenges and work on them together to embrace changes and secure new opportunities. If we can stimulate together a responsible, sustainable, and positive industry, we can be assured of a future of growth that will benefit everyone.”



Sylvie Mamias  
**Secretary General of Union Fleurs**



# New and More Stringent Environmental and Social Criteria for Producers

**B**russels based multi-stakeholder initiative the Floriculture Sustainability Initiative (FSI) new and more stringent environmental and social criteria for producers was introduced. This criterion entailed enhancing the scope of the FSI Basket of Standards.

Since 2013 FSI has been implementing a system in which transparent and benchmarked standards are recognized as solid basis for good practice. The standards meeting good agricultural and social practices are included in the FSI Basket of Standards and considered as international reference for responsibly produced and



*Mr. Jeroen Oudheusden*

traded flowers and plants.

To secure progress made, stimulate further improvement, and prepare for future requirements, new environmental and social requirements have been implemented as FSI Basket Benchmark criteria. Hence more aspects of sustainability are covered to the FSI benchmarks.

Since January 2021, the FSI Basket of Standards includes three scopes: GAP, Social and the new Environmental scope. To comply with the FSI requirements, producers need to be certified by at least

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FSI members believe that our sector is only future proof if we show leadership and embed responsible practices in the entire supply chain. Part of our strategy is to achieve this by encouraging producers to be certified and to stimulate responsible sourcing at trade and retail level”.

owners have time to adapt and develop risk assessment solutions. Ideally these risk assessments take place during regular audits to make them time and cost efficient.

were not always transparent or fully covered by existing requirements and certifications. Therefore, FSI implemented a system in which transparent and benchmarked standards are recognized as solid basis for good practice. The standards meeting good agricultural and social practices have been included in the FSI Basket of Standards and are the international reference for responsibly produced and traded flowers and ornamentals.

one of the accepted standards in both GAP and Environmental scopes. Producers in risk countries will additionally have to obtain one of the accepted certificates for the Social scope, an unchanged requirement since 2013.

FSI Executive Officer, Jeroen Oudheusden, explains: “consumer awareness, new market requirements and upcoming legislation around social/ethical issues have instigated discussions on how to best anticipate to these new requirements. FSI members believe that our sector is only future proof if we show leadership and embed responsible practices in the entire supply chain. Part of our strategy is to achieve this by encouraging producers to be certified and to stimulate responsible sourcing at trade and retail level”.

Moreover, another new requirement will be added to the benchmark in the coming years. Producers in low-risk countries (like North America and most countries in Europe) will be asked to conduct a third-party social risk assessment on site or demonstrate compliance through a social certificate from the FSI Basket. To comply with this future requirement, FSI will develop benchmark criteria so that scheme

This new FSI Basket requirement will be effective from 1 January 2024 to allow time for implementation. For the FSI members, reporting on these criteria will be compulsory to track progress and is part of the 90% responsible production and trade ambition.

**The Floriculture Sustainability initiative**

The 75 members of the Floriculture Sustainability Initiative, including producers, traders and retailers of flowers and plants, are committed to increase responsibility and transparency, with the aim of keeping the industry future proof. To achieve this, FSI members address sustainability issues together, at sector level and focus their efforts around three pillars: responsible production and trade, responsible conduct, and integrated reporting.

The definition of responsible production and trade has expanded over the years as new environmental and social aspects emerged that

**Source: Floriculture Sustainability Initiative (FSI)**





## KEPHIS Trains Experts to Fight, Detect New Invasive Mango Pest

**T**he Kenya Plant Health Inspectorate Service is training experts to help detect a new invasive mango mealybug pest.

According to the UN-Food and Agriculture Organization that is supporting in training the experts, early detection and early identification of the pest will give countries in Eastern Africa region an advantage to launch early action.

This will help mitigate the damaging effects of the pest. Mango mealybug feeds on the tree and produces droppings which make the leaves black and sticky. This lowers the strength of the tree and its production of mangoes. During heavy attacks, a whole part of the tree looks blackish in colour.

The mealybugs are easily spread through international trade in plant materials. The 18 diagnostic experts come from Burundi, Djibouti, Ethiopia, Eritrea, Kenya, Rwanda, Somalia, South Sudan and Uganda.

The training is being carried out by KEPHIS in collaboration with FAO, the Natural History Museum, London, UK and the Centre of Phytosanitary Excellence (COPE). Orlando Sosa, FAO Agricultural Officer in Eastern Africa said the pest was first detected in 2019 in Rwanda.

“The pest has since spread to Uganda and Burundi. As part of its efforts, FAO has engaged partners on the identification of mealybugs and their parasitoids (natural enemies) and KEPHIS to train personnel from

the Ministries of Agriculture from each of the nine countries that make up the FAO Eastern Africa sub-region,” said Sosa.

### Devastating damage

The experts will be tasked to learn the methods for field detection, sample collection, sample preparation, slide preparation and diagnosis of specimens of a range of mealybug species that are common to Eastern Africa.

He explained that the damage they cause can be devastating, leading to crop loss, restricted market access and increased cost of production.

“These pests can be easily overlooked due to their small size, cryptic habits and because they do not resemble most other insects. Management of mealy bugs is difficult as they develop resistance to conventional control products. In recent years, they have become major pests, with new introductions of invasive species like papaya mealybug, cotton mealybug and now the mango mealybug,” said Sosa.

Theophilus Mutui, KEPHIS managing director said it is only with specialized diagnostic confirmation that the presence of the mango mealybug can be made and thereby, the relevant action to control its spread can be taken.

He pointed out the need to remain vigilant and conduct surveys of urban and rural areas in order to detect as early as possible the

presence of the mango mealybug.

Mutui said Kenya is committed to collaboration that contributes to the reduction of plant health risks through minimizing trade costs by making trade in plants, plant products and regulated articles more transparent and efficient.

“We recognise the limitations of available resources and structures that have led to challenges in the management of invasive species most of which require countrywide and regional management. This can only be overcome through coordinated and comprehensive collaboration, partnerships and sharing of information that will facilitate preventing the introduction, spread and establishment of mealybug pests,” he said. Sosa said it is not a matter of if mango mealybug will arrive in Kenya and other Eastern Africa countries but a matter of when.

He said FAO is taking action by raising awareness of the threat of the mango mealybug across Eastern Africa by training experts to identify mealybug species in their territories and specifically the mango mealybug.

“FAO is also boosting capacity for early detection in agricultural and urban areas, facilitating the importation and release of the effective biological agents following a strict adherence for scientific review of the safety of introduction of new organisms into the territories of the affected countries,” said Sosa



# Flower farmers reject county assembly's proposal to impose new levy, term it unconstitutional



Flower farmers have termed as illegal plans by the Nakuru County Government to introduce a new levy to growers. The Kenya Flower Council (KFC) says according to the Constitution, it is only the national government that has the mandate to collect levy from export produce.

The Chief Executive Officer Clement Tulezi said a previous attempt by the county to introduce cess backfired after the High Court termed it illegal.

The Nakuru County Flowers Service Charge Bill (2020), if signed into law, will allow the county to collect one per cent of gross sales from the farmers.

During the passing of the Bill, MCAs argued that the money would be used for infrastructural development in the area where the of food will be lost," said Dr Njagi in a meeting organised by Science Kenya Africa.

The researcher argued that limiting farmers' access to necessary technologies would risk livelihoods and compromise food security. Ms Shollei argues that the cancer-causing herbicides and pesticides banned in the United States and Europe were still being imported and sold in Kenya despite the health risks it poses to the people.

Pest Control Products Board General Manager Paul Ngaruiya said they have started reviewing more than 200 pesticides used in the country following a request by the National Assembly in the light of the petition before Parliament on these chemical use.

In a bid to increase the food safety standards, the Pest Control Products Board says it has contracted more experts to start evaluating

revenue was collected. But the council says the sector was being unfairly targeted by the national and county governments due to the wrong perception that it made huge profits.

He also termed the Bill as double taxation as farmers paid their taxes through the Horticultural Crop Directorate. "We have written to the county assembly voicing our disagreement over the Bill but we are still waiting to see if it will be signed into law," he said.

In 2019, the High Court sitting in Nakuru ruled that the county had no jurisdiction to collect levy on export produce.

Mr Tulezi said the sector was paying 45 taxes to the State, a move that was affecting the margin profits against a drop in flower prices in the EU market. "Currently we are the highest taxed sector in the country despite the emerging challenges of high cost of fuel, labour, farm inputs and a drop in flower prices," he said.

Under the proposed law, a charge of one per cent on sales would see the county earn nearly Sh300 million every year.

The Bill proposes that the money is remitted to the county government on the 20th day of the following month, and failure to comply would attract a fine of up to Sh1 million. The board said pesticides in the National Assembly petition. The board says it has completed the construction of the multi-million laboratory for testing of these products.

The official also said the laboratory would play a major role in minimising the interception of consignments to key markets due to high residue levels, which improper use of pesticides by farmers cause.

## Kenya risks Sh150bn loss in pesticides ban

Kenya stands to lose more than Sh150 billion if the ban on the use of agricultural chemicals is effected, a research think tank has said.

The Egerton-based Tegemeo Institute of Research and Policy says Kenya being in the tropics, farmers cannot afford to grow crops without using chemicals to control pests and diseases.

Uasin Gishu Women Representative Gladys Boss Shollei is sponsoring a Bill in Parliament aimed at banning the use of at least 200 chemicals locally, which Tegemeo says will lead to 40 percent losses in food production. Timothy Njagi, a senior researcher at the institution, said the ban on these chemicals would be detrimental to food security, forcing Kenya to rely on imports to meet its annual needs.

Dr Njagi said the country would lose an equivalent of 16 percent in terms of the gross domestic product should farmers abandon the use of pesticides and herbicides in their farming practices.

"If the ban is effected, then Kenya will have no alternative but to become a net importer of food

## KEPSA wants taxes on farm inputs reduced

The Kenya Private Sector Alliance (Kepsa) now wants taxes on solar panels, pesticides and power tariffs reduced as one way of cushioning farmers and manufacturers.

The alliance that brings together manufacturers said the continued rise in cost of production was due to rising cost of fuel and electricity.

This comes after the Senate said the soaring prices of electricity and fuel were forcing manufacturers to close shop and head to neighbouring countries.

According to Kepsa, tens of businesses that were affected by Covid-19 were yet to fully recover, despite the government lifting curfew and reopening the economy.

This emerged during a stakeholders' meeting in Naivasha where the issue of double taxation re-emerged, with calls to urgently address the matter before Kenya loses more investors.

Kepsa Chief Executive Officer Carole Kariuki said the number of taxes and licences an investor requires to operate in the country is worrying. Kariuki added that this had been worsened by levies imposed by county governments, pushing high production costs to the over-taxed investors.

"We are calling on the government to reduce taxes on pesticides and solar so that manufacturers can have alternative sources of energy as electricity

is very expensive," she said.

Kariuki said many manufacturers and farmers had raised their concerns over double taxation by county governments, which they said is affecting inter-county trade. "It's becoming nearly impossible for manufacturers and farmers to move their goods from one county to another due to the punitive and high levies imposed," she said.

Earlier, the Kenya Flower Council (KFC) said floriculture was one of the highest taxed sectors in the country, despite a rise in the number of challenges facing the farmers. According to the council, flower farmers are currently paying a record 45 different taxes to both the national and county governments every year.

According to council CEO Clement Tulezi, the national and county governments are unfairly targeting flower farmers, despite the losses they are incurring. He said the over-taxation was affecting their profit margins amid a drop in flower prices in the EU market.

"The government should spread its tax margins to the informal sector instead of unfairly targeting flower farmers due to the misconception that they make millions in profit," said Tulezi. Nakuru County Assembly has introduced a Flowers Service Charge Bill that seeks to collect one percent of gross sales from the farmers.



## Netherlands to import flowers from Kenya via Lamu port

Kenya sells 70 per cent of its flowers to Europe which includes Netherlands

### In Summary

- The horticultural sector is Kenya's third-largest foreign exchange earner with the flower industry directly employing 150,000 people.



**Mr. Maarten Brouwer,  
Netherlands ambassador to Kenya**

- The envoy said Netherlands has an open economy that depends heavily on foreign trade and investment.

The Netherlands is set to commence importation of flowers from Kenya using the new Lamu port as the gateway.

Netherlands ambassador to Kenya Maarten Brouwer revealed this when he paid a courtesy call on Governor Fahim Twaha in Mokowe, Lamu West.

As the world's third-largest exporter of



**Mr. Fahim Twaha,  
Lamu Governor**

cut flowers, Kenya sells 70 per cent of its flowers to Europe which includes the Netherlands.

The horticultural sector is Kenya's third-largest foreign exchange earner with the flower industry directly employing 150,000 people and contributing 1 per cent of the country's GDP.

The envoy said the Netherlands has an open economy that depends heavily on foreign trade and investment.

During the visit, the governor and ambassador discussed several matters of mutual interest to Lamu and the Netherlands, among them exploring the viability of engaging in the flower exportation business from Kenya to the Netherlands using Lamu Port.

"We have already visited Nakuru and other counties to see how better we can work on exporting flowers to the Netherlands by sea, a programme that will take five to 10 years to be actualised," the ambassador said.

Netherlands imports from Kenya an average \$35 million worth of flowers a month.

Kenya exports mainly horticultural produce to the European country, in particular, cut flowers.

Besides flowers, Kenya's other exports to the Netherlands include tobacco, vegetables and fruits.

The ambassador further urged the government to train and support fishermen for easier transformation of the sector which has been affected by port activities.

Twaha termed the envoy's visit as timely owing to the good infrastructure that the government has invested in Lamu and enhanced security.

He said the county government would explore further possible areas of collaboration with the Netherlands to ensure the Lamu port becomes the major gateway for the flower project and many others.

The governor noted that the move will equally contribute to the sprouting of related industries and businesses once the multi-million project commences.

"With the Netherlands being among the leading importers of cut flowers and buds for bouquets from Kenya, my government is willing to explore all possible areas of collaborations to ensure Lamu Port becomes the gateway of this multi-million project," Fahim said.



## Kenya to Export More Frozen Avocados to China

**T**he frozen

avocados market is yet to pick, this is according to the Horticulture Crops Directorate which is under the Agriculture and Food Authority (AFA), Mr. Benjamin Tito. Most exporters have been unable to meet the stringent requirements to enjoy the market. In the year 2020, Kenya was a lead exporter of avocados in Africa and was among the top 10 world's largest exporters with the leading zones being Holland, France, United Kingdom, UAE and Saudi Arabia.

According to Benjamin, in 2020, Kenya managed to ship only one 20ft container of ripe and frozen avocados. This was after the signing of an agreement by President Uhuru Kenyatta and Xi Jinping of China that would authorize the exportation of frozen avocados at a temperature of between 70C TO 150C, from Kenya as way of evading the fruit fly menace.

"After harvesting, the outer peel will be removed as well as the seed. Then the remaining avocado will be packed and shipped to the overseas China Market at a temperature of between 70C TO 150C to avoid browning of the fruit," Benjamin said, adding that the profit margin is not that promising as the cold supply chain is posing challenges too.

The market is slowly picking according to Benjamin due to strict regulations for exporters who have to invest heavily as well as travel restrictions to China. Nonetheless, he talked of arranged plans in the ministry of Trade to work out on the latter.





# FLOWER & VEGETABLE FARMS IN KENYA

FARM NAME	PRODUCT	LOCATION	CONTACT PERSON	TELEPHONE	E-MAIL
AAA- Flowers-Rumuruti	Roses	Rumuruti	Anil	-	-
AAA- Flowers -Chui Farm	Roses	Timau	Phanuel Ochunga	07522506026	-
AAA-Simba Farm	Roses	Rumuruti	Eliud Wachiya	0727258218	-
Fairy Flowers	cutings	Limuru	Kennedy Kamau	0712204894	kenreal07@gmail.com
Farm-Sunripe		Naivasha	Antony	0711827785	naivasha@sunripe.co.ke
Across Agriculture Ltd	Herbs	-	Emily Chepkemoi	0729080186	chep28@gmail.com
Africalla Kenya Ltd	Cuttings	Eldoret	Meindert	-	meindert@africalla.com
Africa Blooms	Roses	Salgaa	Ramnath Sarbande	0780314387	ramnath.sarbande@xflora.net
Afriscan Kenya Ltd	Hypericum	Naivasha	Charles Mwangi	-	-
Aquila Development Co	Roses	Naivasha	Abhay Marathe	0729776656	gm@aquilaflowers.com
Balaji Flowers	Roses	Olkalou	Ra0 Venkatesh	0726337266	-
Baraka Farm	Roses	Ngorika	Lucy Yinda	-	lucy@barakaroses.com
Batian Flowers	Roses	Nanyuki	-	-	-
Beautyline	Flowers	Naivasha	Peter Gathiaka	0721392559	peter@beautyli.com
Big Flowers	Roses	Timau	Gideon Waweru	0721178974	-
Bigot Flowers	Flowers	Naivasha	Kakasaheb Jagtap	0722205271	jagtap.kt@bigotflowers.co.ke
Bila Shaka Flowers	Roses	Naivasha	Joost Zuurbier	0722204489	bilashaka.flowers@zuurbier.com
Black Petals	Roses	Limuru	Nirzar Jundre	0722848560	nj@blackpetals.co.ke
Bliss Flora Ltd	Roses	Njoro	Appachu Sachin	0789101060	appachu7@yahoo.com
Blue Sky	Gypsophilla	Naivasha	Patel Sushant	0725622333	info@blueskykenya.com
Bloom Valley		Salgaa	Karani	0733529666	-
Blooming Dale Roses Kenya Ltd	Roses	Nanyuki	Sunil	0718991182	info@bloomingdaleroses.com
Buds and Blooms	Roses	Nakuru	Shivaji Wagh	0720895911	shivanimket@yahoo.com
Carzan (K) Ltd KS	Summer flowers	Salgaa	Stanley Rotich	0721931710	stanley@carzankenya.com
Carzan (K) Ltd ST	Hypericum, solidago		Adung'o	0716019094	adung'o@carzankenya.com
Carzan - Molo	Carnations	Molo	Charles Chelule	0728784081	charles.chelule@carzankenya.com
Charm Flowers	Flowers	Athiriver	Ashok Patel	020 352583	ashki@charnflowers.com
Chestnut	Flowers	Mt. Kenya	Gabriel Kiai	-	gabriel.kiai@aaagrowers.co.ke
Colour Crops	Hypericum	Nanyuki	Kennedy Wanyama	0716389472	colourcrops@tmu.com
Colour crops	Summer Flowers-	Bahati	Patrick Kipkurui	0727806184	kipkirui89@gmail.com
Colour crops Naivasha	Flowers	Naivasha	Geoffrey Mwaura	0722200972	nva@colourcrops.com
Credible Blooms	Flowers	Rumuruti	Eliud Njenga	0722382859	eliud@pigeonblooms.com
Dale Flora	Roses	Mogotio	Ajay Sutar	0711102266	ajay.sutar24@gmail.com
Desire Flowers	Flowers	Isinya	Rajat Chaohan	0724264653	rajatchaohan@hotmail.com
De ruiters	Breeder Roses	Naivasha	Fred Okinda	0722579204	Fred.okinda@deruiter.com
Double Dutch	Cuttings	-	Pharis Wainaina	0728207661	
Dummen Orange	Flowers Breeders	Naivasha	Steve Outram	0733 609863	s.outram@dummenorange.com
Eco Flora	Roses	Salgaa	Jackson Mbanya	0723565630	production.eco@btfgroup.com
Elbur flora- kimman	Roses	Nakuru	Daniel Moge	0721734104	kimmanexp@gmail.com
Enkasiti Thika	Flowers	Thika	Tambe	0734256798	enkasiti@gmail.com
Equinox	Flowers	Nanyuki	Harry Kruger	0707266956	harry@equinoxflowers.com
Everest Flowers Ltd	Flowers	Mt. Kenya	-	-	-
Everflora Ltd.	Flowers	Thika	Ghanshyam Dusang	0721638005	manager1@everflora.co.ke
Evergreen Crops		Nairobi	Arun Singh	0721941009	arun@evergreencrops.com
Exotic Peninah	Roses/ Carnations	Athiriver	Dan	0734626942	dan@exoticfields.com
Fairy Flowers	Flowers	Limuru	Sylvester	0753444237	sylvesterkahoro@yahoo.com
Fides Kenya Ltd	Cuttings	Embu	Bernard Marindany	0726 366 752	B.Marindany@DummenOrange.com
Finlays- Lemotit	Flowers	Kericho	Japhet Langat	0722 863527	japhet.Langat@finlays.co.ke
Fontana Ltd - Akina farm	Roses	Njoro	Mahindra Patil	0798254199	--
Fontana Ltd - Ayana Farm	Roses	Mau Narok	Osman	-	-
Flamingo Holdings Farm	Flowers	Naivasha	Peter Mwangi	0722204505	peter.mwangi@flamingo.net
Flamingo Holdings- Kingfisher Farm	Flowers	Naivasha	Mr. Isaac Karanja	0720473502	kingfishercarnations@flamingo.net
Flamingo Holdings- Kingfisher Farm	Flowers	Naivasha	Jacob Wanyonyi	0722773560	jacob.wanyonyi@flamingo.net
Flamingo Holdings-Siraji Farm	Carnations, Roses	Nanyuki	Peris Muturi	-	-
Flamingo Flora	Roses	Njoro	Sam Nyoro	0721993857	s.ivor@flamingoflora.co.ke
Flora ola	Roses	Solai-Nakuru	Lucas Choi	0721832710	lucas.floraola@gmail.com
Flora Delight	Summer flowers	Kiambu/ Limuru	Marco	0710802065	marcovansandijk@yahoo.com
Florensis Ltd	Cuttings	Naivasha	Anne Marie		annemarie@florensis.co.ke
Florenza Ltd	Roses	Solai	Yogeesh	0737453768	farm.florenza@megaspingroup.com



# FLOWER & VEGETABLE FARMS IN KENYA

FARM NAME	PRODUCT	LOCATION	CONTACT PERSON	TELEPHONE	E-MAIL
Fresh Gold Flowers Ltd	Flowers	Mt. Kenya	John Karimi	0721622294	karimi@freshgoldkenya.co.ke
Gatoka Roses	Roses	Thika	Herman Njuguna	0728 854 844	info@gatokaflowers.com
Golden Tulip	Roses	Olkalao	Umesh Choudhery	0739729658	umesh@bth.co.ke
Groove	Flowers	Naivasha	John Ngoni	0724448601	groovekenya@gmail.com
Hanna Roses Ltd	Roses	Thika	Kadlag Palaji	0723149968	kadlag.paraji@hannaroses.com
Harvest Ltd	Roses	Murungaru	Julius Oloo	0721465853	oloo@harvestflowers.com
Harvest Ltd	Roses	Athiriver	Julius Oloo	0721465853	oloo@harvestflowers.com
Harvest Ltd	Roses	Olkalou	Julius Oloo	0721465853	oloo@harvestflowers.com
Heritage Flowers Ltd	Roses	Rumuruti	Shailesh Kumar	0722203750	hfl.srk@gmail.com
Highland plantations	Cuttings & Herbs	Olkalao			production@highlandplants.co.ke
Imani Flowers	Summer Flowers	Nakuru	Raphael Otieno	0792302466	raphael@imaniflowers.co.ke
Interplant Roses	Roses	Naivasha	Gavin Mouritzen	0733220333	info@interplantea.co.ke
Isinya	Flowers	Isinya	Rajesh	-	pm@isinyaroses.com
Karen Roses	Flowers	Nairobi	Peter Mutinda	0723353414	pmutinda@karenroses.com
Kariki Ltd- Thika	Flowers	Thika	Miriam	-	production@kariki.co.ke
Kariki Ltd - Nanyuki	Eryngiums	Nanyuki	Richard Fernandes	062-31023/6	bondet.production@karik.biz
Kariki Ltd - Naivasha	Summer	Naivasha	Glory Gatwiri	0718328382	hamwe.production@kariki.biz
Kariki Ltd - Molo	Fowers	Molo	James Oluoch	0716333717	jame.oluoch@kariki.biz
Kariki - Hamwe	Hypericum	-	Benjamin Ribai	0723721748	hamwe.fm@kariki.biz
Kenflora Limited		Kiambu/ Limuru	Abdul Aleem	0722311468	info@kenflora.com
Kentalya	Cuttings	Naivasha	Linnet	0733549773	lynette@kentalya.com
Kikwetu		Mt. Kenya	Rathan	0787266007	
Kisima Farm Ltd	Roses	Timau	Craig Oulton	0722205828	craig@kisima.co.ke
Kordes Roses	Roses- Breeders	Karen	Luce	0735995566	info@kordes-ea.com
Kongoni River Farm - Gorge Farm	Roses	Naivasha	Anand Patil	0728608785	anand.patil@vegpro-group.com
Kongoni River Farm - Liki River	Flowers	Nanyuki	Madhav Lengare	0722202342	madhav@vegpro-group.com
Kongoni River Farm - Star Flowers	Roses	Naivasha	Jagtap Shahaji	0792547633	jagtap@vegpro-group.com
Kongoni River Farm - Kongoni	Flowers	Timau	-	-	--
Kongoni River Farm - Mangesh	Flowers	Timau	Mangesh	0797 874583	
Kongoni River Farm - Galaxy	Roses	Naivasha	Chandrakant Bachche	0724639898	chandrakant.bachche@vegpro-group.com
Kongoni River Farm- Longonot	Roses	Naivasha	Ravi Sathe	0715173603	ravi.sathe@vegpro-group.com
Lamorna Ltd	Roses	Naivasha	Mureithi	0722238474	admin@lamornaflowers.com
Lathyflora		Limuru	Mbauni John	0753888126	info@lathyflora.com
Lauren International	Flowers	Thika	Dilip	0720796629	laurenflowers@accesskenya.co.ke
Laurel Investment	Roses	Nakuru	Rajendra Jadhav	0738359459	rajendra.laurel@bht.co.ke
Livewire	Hypericum	Naivasha	Esau Onyango	0728606878	management@livewire.co.ke
Lolomarik	Roses	Nanyuki	Topper Murry	0715 727991	topper@lolomarik.com
Maridadi Flowers	Flowers	Naivasha	Jack Kneppers	0733333289	jack@maridadiflowers.com
Maua Agritech	Flowers	Isinya	-	-	-
Mau Flora	Roses	Molo	Manju	0748254171	manju@mauflora.co.ke
Milenium Growers	Summer Flowers	-	Sushant Wankara	0731316000	sushant@marvelgreens.com
Molo Greens	Solidago, carnations	-			
Mt. Elgon Flowers	Roses	Eldoret	Bob Anderson	0735329395,	bob@mtelgon.com
Mwanzi Flowers Ltd	Roses	Rumuruti	Ram	0722265845	-
Mzuurie Flowers - Maji Mazuri	Roses	Eldoret	Mark Juma	0727471034	mjuma@majimazuri.co.ke
Mzuurie Flowers - Molo River Roses	Flowers	Kilelwa	Andrew Wambua	0724256592	awambua@moloriverroses.co.ke
Mzuurie Flowers - Winchester Farm	Roses	Karen		0725848909	
Mzuurie Flowers - Winchester Farm	Flowers	Bahati		0725848909	
Nini Farms	Roses	Naivasha	Philip Kuria	0720611623	production@ninilt.com
Nirp East Africa	Roses	Naivasha	Danielle Spinks	0702685581	danielles@nirpinternational.com
OI Njorowa	Roses	Naivasha	Charles Kinyanjui	0723986467	mbegufarm@iconnect.co.ke
Oserian	Flowers	Naivasha	-	-	-
Panda Flowers	Roses	Naivasha	Vivek Sharma	0731040498	gm@pandaflowers.co.ke
Panocol International	Roses	Eldoret	Mr. Paul Wekesa	0722748298	paul.wekesa@panocol.co.ke
Penta	Flowers	Thika	Tom Ochieng	0723904006	tom@pentaflowers.co.ke
Pendekeza	Roses	Nanyuki	Richard Siele	0722716158	tambuzi.sales@tambuzi.co.ke
PJ Dave Flowers	Flowers	Isinya	Sanjiv Dogra	0737576966	pjdaveflowers@wananchi.com
PJ Flora	Roses	Isinya	Santos Kulkarni	0738990521	santosh@pjdave.com



# FLOWER & VEGETABLE FARMS IN KENYA

FARM NAME	PRODUCT	LOCATION	CONTACT PERSON	TELEPHONE	E-MAIL
Plantech Kenya Ltd	Propagators	Naivasha	Idan Salvy	0702187105	idan@plantechkenya.com
Porini Flowers	Roses	Molo	Shakti	0739676998	gm@poriniflowers.com
Primarosa Flowers Ltd	Roses	Olnjororok	Peter G. Njagi	0718342381	production.mp2@primarosaflores.com
Rain Forest Farmlands Ltd	Roses	Naivasha	Boniface Kiama	0718925040	longere@fleurafrica.com
Ravine Roses Flowers	Flowers	Nakuru	Peter Kamuren	0722780811	bkiama@fleurafrica.com
Redland Roses	Flowers	Thika	Aldric Spindler	0733603572	aldric@redlandsroses.co.ke
Redwing Flowers	Flowers	Nakuru	Simon Sayer	0722227278	sayer@redwingltd.co.ke
Rift Valley Roses (K) Ltd	Flowers	Naivasha	Peterson Muchiri	0721216026	fm@riftvalleyroses.co.ke
Rimiflora Ltd	Hypericum	Njoro	Richard Mutua	0722357678	richard@rimiflora.com
Riverdale Blooms Ltd	Flowers	Thika	Antony Mutugi	0202095901	rdale@swiftkenya.com
Roseto	Roses	Roseto	Aravind	0786157344	gm.roseto@megaspingroup.com
Savannah international	Geranium	Naivasha	Ignatius lukulu	0728424902	i.lukulu@savanna-international.com
Selecta Kenya		Thika	Robert Khamala	0727 467 464	r.khamala@selectakenya.com
Sojanmi Spring Fields	Roses	Njoro	Ashesh Mishra	0792217088	ashesh@xflora.net
Schreus	Roses	Naivasha	Haiko Backer	-	-
Shades Horticulture	Flowers	Isinya	Ashutosh Mishra	0722972018	info@shadeshorticulture.com
Shalima Flowers (k) Ltd	Flowers	Nairobi	Natarajan	0738 999149	natarajan@eaga.co.ke
Shalimar Shalimar	Flowers	Naivasha	Dinkar Wandhekar	0702418174	dinkar@eaga.co.ke
Shalimar- Kabuku Farm	Flowers	Thika	Mohan Raj	0724265777	kabukufm@eaga.co.ke
shalimar-Mahee Farm	Roses	Olkalao	Kirthan	0705401431	maheefm@eaga.co.ke
Shalimar-Mwanzi Farm	Flowers	Rumuruti	Ram	072426585	mwanzifm@eaga.co.ke
Sian Roses - Maasai Flowers	Flowers	Isinya	Anthony Kipng'eno	-	-
Sian Roses - Agriflora (K) Ltd	Roses	Nakuru	Charles Mulemba	-	cmulemba@sianroses.co.ke
Sian Roses - Equator Roses	Roses	Eldoret	Nehemiah Kangogo	0725848910	nkangogo@sianroses.co.ke
Sierra flora	Roses	Njoro	-	-	farm.sierra@megaspingroup.com
Simbi Roses	Roses	Thika	Karue Jefferson	067 44292	simbi@sansora.co.ke
Sirgoek Flowers	Flowers	Eldoret	Andrew Keittany	0725 946429	sirgoek@africaonline.co.ke
Solai Milmet/Tindress	Flowers	Nakuru	-	-	solairoses@gmail.com
Subati Flowers	Roses	Subukia	Naren Patel	0712 584124	naren@subatiflowers.com
Subati Flowers	Roses	Naivasha	Naren Patel	0712 584124	naren@subatiflowers.com
Suera Flowers Ltd	Roses	Nyahururu	George Kimathi	0724622638	gkbuuri@gmail.com
Sunfloritech	Roses	Naivasha	A Duzairajan	0794572232	farmmgr.tulaga@btfgroup.com
Sunland Timau Flair	Roses	Timau	Ken Mwiti	-	info@lobelia.co.ke
Stockman rozen	Roses	Naivasha	Julius muchiri	0708220408	julius@srk.co.ke
Syngenta Flowers - Kenya Cuttings	Flowers	Thika	Kavosi Philip	0721225540	philip.munyoki@syngenta.com
Syngenta Flowers - Pollen	Flowers	Thika	Joseph Ayieko	0733552500	joseph.ayieko@syngenta.com
Tambuzi	Roses	Nanyuki	Richard Siele	0722716158	tambuzi.sales@tambuzi.co.ke
Terrasol	Cuttings	Limuru	Benard Adwarh	0753444230	adwarh@terrasolkkenya.com
Timaflo Ltd	Flowers	Nanyuki	Simon van de Berg	0724443262	info@timaflo.com
Top Harvest	Roses	-	Pius Kimani	0721747623	pius.kimani@gmail.com
Transebel	Flowers	Thika	David Muchiri	0724646810	davidmuchiri@transebel.co.ke
Uhuru Flowers	Flowers	Nanyuki	Ivan Freeman	0713889574	ivan@uhuruflores.co.ke
Utee Estate	Chrysanthemums	Nairobi	Appaso Mane	0737 513 844	mane.uel@btfgroup.com
United Selections	Roses -Breeder	Nakuru	Fred Kisumo	0720107691	fkisumo@united-selections.com
V.D.Berg Roses	Flowers	Naivasha	Johan Remeuus	0721868312	johan@roseskenya.com
Valentine Ltd		Kiambu/Limuru	Joseph Kariuki	0728 093 379	joseph.kariuki@valentnegrowers.com
Van Kleef Kenya Ltd	Roses		Judith Zuurbier		roses@vankleef.nl
WAC International	Breeder	Naivasha	Richard Mc Gonnell	0722810968	richard@wac-international.com
Waridi Ltd		Athi River	Julius Ruto	-	farmmanager@waridi.com
Wilham Kabuku	-	Nairobi	Natarajan	0735 792 063	natarajan@eaga.co.ke
Wildfire	Roses/summer	Naivasha	Eliud Kimani	0727598349	roses@wildfire-flowers.com
Wilfay Flowers	Gypsophila/hypericum	Subukia	Makori	0723358644	makoriwilfay@gmail.com
Wilmar Agro Ltd	Summer Flowers	Thika	Alice Muiruri	0722 321203	alice.muiruri@wilmar.co.ke
Windsor		Thika	Pradeep Bodumalla	0736 586 059	farm@windsor-flowers.com
Xpressions Flora	Roses	Njoro	Brijesh Patel	0715469732	brijesh.patel@xflora.net
Zena - Asai Farm	Roses	Eldoret	Japheth Chelal	0721770597	-
Zena Roses - Sosiani Farm	Roses	Eldoret	Jackson Mbanya	-	-
Sololo Agriculture	-	-	Andrew Tubei	-	-



# UniGo 50%SC™

A novel fungicide for the management of **Downy Mildew**, **Powdery Mildew**, and **Botrytis** in Roses.

## DOWNY MILDEW



## POWDERY MILDEW



## BOTRYTIS



## *Benefits:*

- Broad spectrum fungicide with systemic and protectant properties.
- Cost effective and helps in resistance management.
- Best product to control soil borne diseases such as Fusarium, Sclerotinia and Rhizoctonia rots.

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