March- April 2021

THE LEADING FLORICULTURAL JOURNAL IN THE REGION

FLORICULTURE

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Downy Mildew in Roses

Difficult to Diagnose and Control

Reference Table

PRODUCT	ACTIVE INGREDIENT	CHEMICAL GROUP (FRAC CODE)	BIOCHEMICAL MOA	Effect on disease cycle	BIOLOGICAL MOA	RATE /HA	MODE OF APPLICATION
Melody Duo	Propineb 600 g/kg + Iprovalicarb 90 g/kg	dithio-carbamates (M 03) valinamide carbamates (40)	multi-site activity + cell wall biosynthesis	Spore germination, Haustoria formation, Mycelial growth, Inhibit spore formation.	Contact and Systemic	2.25 kg	Foliar spray
INFINITO	Fluopicolide 62.5 + Propamocarb Hydrochloride 625 g/l	pyridinylmethyl-benzamides(43) carbamates (28)	Cytoskeleton and motor protein + lipid synthesis or transport	Spore germination, Mycelium growth, Spore production	Translaminar and Systemic	1.2- 1.5 Lt	Foliar spray
PREVICUR ENERGY	Propamocarb Hydrochloride 530g/l + Fosetyl Aluminium 310 g/l	carbamates (28) ethyl phosphonates (P07)	lipid synthesis or transport + host plant defence induction	Inhibit mycelial growth, reduces sporangia production and sporulation, Stimulate natural defence reaction.	Systemic	2.5 Lt	Drench

For more information contact

Maurice Koome: 0704 411 325
Simon Kihungu: 0704 411 315
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Joseph Ngunju: 0715 407 193

NOTE:
PESTICIDE USERS ARE REMINDED TO READ AND FOLLOW INSTRUCTIONS ON THE PRODUCT LABEL FOR DETAILS OF PESTICIDE PRODUCTS USE BEFORE APPLICATION AT ALL TIMES.

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Source: *Results contained here are courtesy of Bayer East Africa Previcur Energy 2020 Trials, Naivasha, Kenya*

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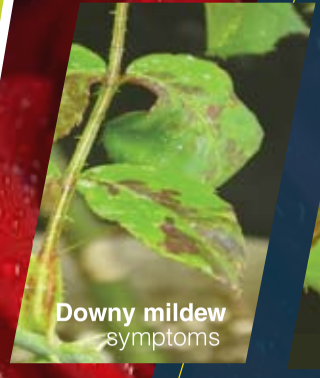

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Contents

The Leading Floriculture Magazine

Floriculture is published six times a year and circulated to personnel in the Horticulture Industry, foreign missions and Kenyan Embassies abroad, Flower Growers, Exporters and Consumers, extension officers in the Ministry of Agriculture and counties, research offices and suppliers of agricultural inputs in Kenya.

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Editorial

Fare Thee Well Raphael

One cannot think of the Floriculture Magazine without thinking of the psychologist Emile Cou'e and his famous affirmation; "Everyday in every way I'm getting better and better". In every two months in everyway, we have been getting better and better.

Today as I pen this editorial I have bid an eternal bye bye to one of its founders; a key pillar and a think tank of the Magazine. For the last 21years Raphael Mbuvi Mulinge has advised, contributed, encouraged and criticised each issue to ensure it continues getting better and better.

I have penned over 120 editorials and never dedicated any to a fallen hero but today I say Fare Thee well, Founder Raphael.

On 30th January 2021 the Salvation Army band led Family, staff, friends and relatives gathering at Mweani Corps, Mbooni subcounty, Makueni County to celebrate the life of one of the pioneer African Flower Farm Managers, Raphael, popularly known as Senior or Nzinga, in the sector.

Eulogising him, the Baringo Senator, who is also the chairman of Mzurrie Group said "Raphael is a rare breed of proffessionals, he mantained a single employer through out his life. He was an astute, committed, principled

and easy to socialize with manager, who mentored many in the sector"

For the rest of the founders, Tom, Victor, Anampiu, Njuki, Francis, Kirigia and Munyao, Raphael sowed the seeds let us continue watering.

Fare thee well Nzinga

Masila Kanyingi
Editor

FLORINEWS

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COMPANY PROFILE

United Agrochemicals Limited™ is a young and dynamic agrochemical company specializing in advanced crop protection solutions, growth promoters and Integrated Pest Management products. It was founded by a businessman Mr. Prakash Daswani in 2017 by registering a number of new generation crop protection products under the guidelines of Pest Control Products Board of Kenya. Our aim is to provide safe, affordable and modern crop protection products and crop inputs services to both floriculture and horticulture farms within the regional market. We have wide range of products for crop protection and yield improvement, which are authenticated with the by-laws in crop produce by PCPB of Kenya. With our advanced and vastly accessible location in Nairobi, Kenya, United Agrochemicals Limited™ has been able to attract and open a great channel of innovative business operations to ensure top of the supply chain standards and total crop care products supply.

Our vision is to provide the best quality agriculture inputs which are ecofriendly and cost effective to the farmers. With our highly skilled field staff, dedicated and committed team members; the company has introduced many revolutionary agrochemical products in the Kenyan market. Apart from selling agrochemicals, the company also provides technical support and guidance to the farmers, to help them to get the right products and methods to increase their productivity. The story of success of the company can be viewed from its huge number of satisfied customers in both floriculture and horticulture sectors. Our agronomists team helps the horticulture farmers across Kenya by educating them about sustainable agriculture practices, thereby, creating self-employment opportunities. Being a business organization, we are quite similar to other agrochemical companies but still remarkably different from the rest as we keep regular contact with the farmers to ensure that their crop production requirements are addressed to make way to real opportunities by effective response to customer satisfaction. The company's operations ethics in crop production and development in the agriculture sector is believed to lead towards our society and nations development. Being a responsible organization, we believe in partnership and growth together.

United Agrochemicals Limited™

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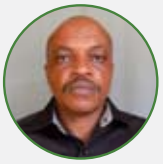
Managing Director



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Time to Reflect
Valentine's Day 2021: Demand Surpasses Supply

While growers are now normal programs, for Valentine's Day (February 14), for growers and the majority of the traders,was a good day. So, time to reflect. Overall, the sense of satisfaction predominates from all parts of the world. Demands seem to have surpassed supply and prices were therefore higher, particularly on the open market as many buyers did not dare to order too early, due to the uncertainties caused by COVID-19. Also, Valentine's Day fell on a Sunday this year, which historically speaking isn't such a good day. Colombia and Kenya had favorable weather conditions, whereas Ecuador had several weather issues which made production come a bit late. The main challenge for all growers around the globe was logistics; the ones who had organized it well are the winners. Also in Russia, growers experienced an unexpected high demand for their Valentine's roses.

High demand and prices

When talking to several rose growers around the world, they are very pleased with the demand. "We are very satisfied. Given the current market situation, we had good orders and we continued to supply," says Kenyan grower Ravi Patel of Subati Group. Also Ecuadorian grower David Espinosa of Matiz Roses said he was satisfied, not only given the COVID-19 pandemic, also the fact that it all on a Sunday. "This always makes you wonder how the whole holiday will unfold, but fortunately everything turned out well at the end."

Ever red

Demand seem to have surpassed supply. "Demand was very high, and we think that is due to COVID-19 lockdowns. Many farms probably did not want to take the risk and increase their production of reds," says Anath Kumar of Isinya Roses in Kenya. Even Ivan Freeman of

Uhuru Flowers, who does not flush their crop for Valentines Day, said the demand had been good for the few extra red roses they had."

Also Dutch rose growers report positive sales. "Valentine's went very well," says Tom Meewisse of Meewisse Roses, the prices increased fast. Due to snow, the market awaited the situation, but picked, the demand was good again and remained good till last day."

"The numbers were not high, but the prices were good," says Marjoland's Angelien van den Nouweland. "In the run-up we had to deal with some uncertainties, cause of the cold days, but fortunatly, we maintained a good climate in our greenhouses, resulting in a good quality of roses."

And a high demand usually results in high prices as well and the figures confirm this. At the Dutch auction clocks, prices were high. Also Örjan Hulshof of Dutch rose breeding company De Ruiter, confirms that the prices were higher than usual. "According to many traders, the supply felt more or less similar to other years, but the demand was a lot higher," he says. As a result, prices increased. "Ecuadorian growers said the prices increased and particularly on the open market. For red, for example, the prices were up 25 to 40 cents per stem and for the colors 5 to 15 cents per stem, compared to last year. When looking at the pre-orders, with fixed prices, only an increase for the reds was noticed; up 15 to 20 cents per stem, while the colors were down by 8 to 12 cents per stem, compared to last year."

There is no room for complacency or postponing readiness and adaptation measures in anticipation of a great valentine's and women's day would ensure continuity'.

Red rose variety Rhodos of De Ruiter.

In Russia, growers said they had an unexpected good Valentine's season. "Valentine's Day seems to become an increasingly important holiday in Russia as well. The demand for Russian roses was high and growers had good temperatures, which means not too cold, to grow good quality flowers."

Isinya Team From Kenya

Lower supply out of Ecuador

This year, Ecuadorian growers had to deal with a lot of weather issues which affected their production. In contrast to last year, when production came early, this year it was late and the amount of stems was less. "All December and January, we had to deal with less hours of sunlight than usual, combined with more rains than usual. As a result, it affected the production. In our case, it was about 9.8% lower than expected," says Espinosa. And the decrease in supply out of Latin America was also noticed on the market. "Traders said that volumes out of Latin America were 3-5% down compared to last year," Hulshof says.

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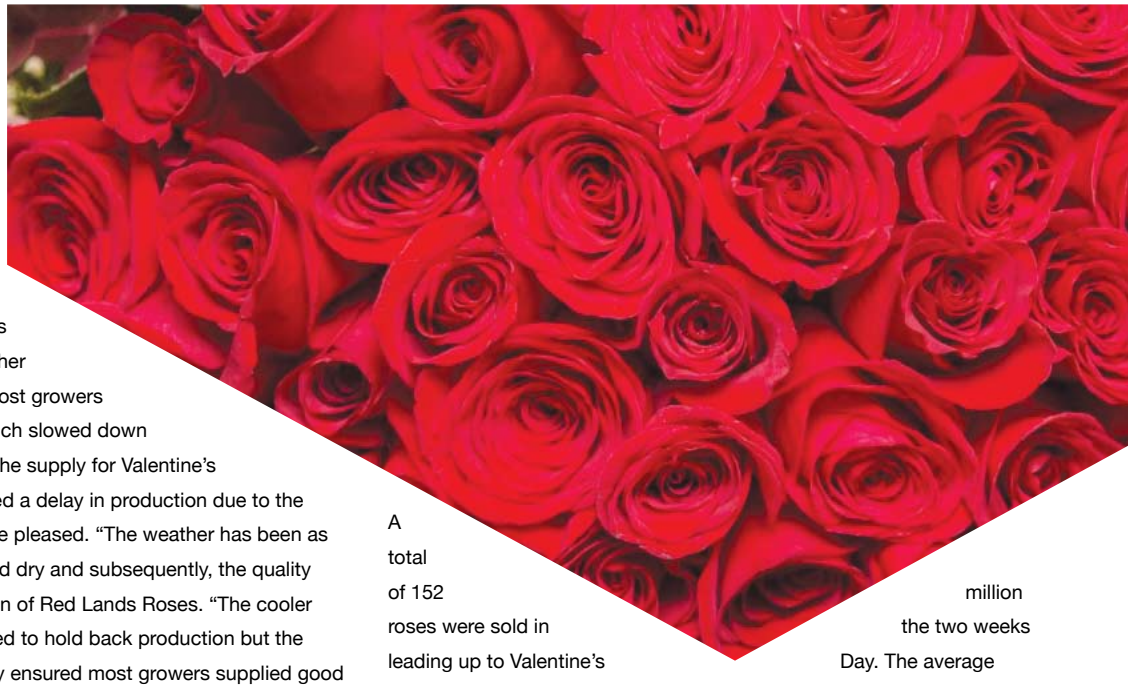

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Better weather in Kenya and Colombia

In Kenya, however, most growers were very pleased with the weather compared it to last year when most growers had to deal with a lot of rain, which slowed down production and in turn reduced the supply for Valentine's Day. Now, some growers reported a delay in production due to the cold nights, but the majority were pleased. "The weather has been as it should be every year sunny and dry and subsequently, the quality is very good," says Isabelle Henin of Red Lands Roses. "The cooler morning temperatures threatened to hold back production but the warmer days from early February ensured most growers supplied good volumes," Issabellah says.

Also in Colombia, growers reported better weather conditions. "Fortunately, this year, there was no frost, however the climate conditions fluctuated heavily resulting in a more equally divided production curve. As a result, shipments were larger than expected, resulting in logistical challenges," explains Hulshof.

Logistics: the biggest challenge

This year, the biggest challenge were the logistics, all growers reported. Freight capacity and rates remained the bottleneck. According to the Kenya Flower Council (KFC), due the lack of flights and limited space, only 75 per cent the produce could be shipped. KFC Chief Executive Clement Tulezi explains that instead of 4,000 tonnes, only 3,000 tonnes could be shipped to Europe this year. "Many commercial carriers have cancelled flights and freighters had good business with vaccines and PPE around the globe," a grower from Kenya says. In turn, the capacity decreased and the rates increased sharply. Also, Kumar adds, snowstorms in Netherlands effected logistics this year.

The day after

Valentine's Day was been a good one for flower growers this year. Sales at the Dutch auction Royal FloraHolland were 33% higher in the two weeks before Valentine's Day, compared with last year. Traders, however, were moderately positive as they had to deal with high purchase prices in the run-up to Valentine's Day, reports VGB (the Association of Wholesalers in Flower Nursery Products). But how was it in the rest of the world and for the last link in the chain, the florists, this year? Overall, in the run-up to Valentine's Day, we saw the demand for roses surpassing the supply. All in all, florists seem to have done a good job as well.

Average price 25% higher for roses at Royal FloraHolland

A total of 152 million roses were sold in the two weeks leading up to Valentine's Day. The average price was about 25% higher than last year, Royal FloraHolland reports. Next to the rose, the tulip and chrysanthemum were also popular. "Together, they accounted for more than 60% of flower sales. Rose sales in weeks 5 and 6 were over 45% higher than last year. For tulip and chrysanthemum, the difference with 2020 was plus 29% and 18%, respectively. The share in total flower sales this Valentine's period for Rose is 33%, Tulip 18.5% and Chrysanthemum 11%."

It was a floral February for Qatar Airways Cargo as it transported millions of flowers for Valentine's Day, one of the biggest events worldwide. Qatar Airways Cargo transported more than 5000 tonnes of flowers, mainly roses and carnations. The increase in floral exports for 2021's Valentine's Day is a testament to the airline's seamless cool chain solutions.

Overall in 2020, Qatar Airways Cargo uplifted close to 32,000 tonnes of flowers.

IAG Cargo flies nearly 450 tonnes of flowers from Nairobi

Few weeks before valentine IAG Cargo ran flights across its network, including four flights a week from Nairobi to London and the US. It was a busy time of the year for flower farms, cargo operators, freight forwarders and distributors who worked hard to ensure consumers worldwide can enjoy floral delights for Valentine's Day.

Bob Andersen, CEO at The Elgon Collection based in Kenya, currently growing roses on 43 hectares, commented, "During all the challenges of Covid-19, buying flowers for a loved one is a small way of making someone feel special. With the success of our flower farm we have been able to build three schools, a hospital, a vocational training centre, a children's home and a training centre. We hope our flowers will brighten up your Valentine's Day this year."

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Bubble Wrapping a Greenhouse: Why, How and What For?

Now available in Kenya

Something all greenhouse owners have in common is the great satisfaction that comes from a greenhouse in summer. In the warmer months, your greenhouse is a fantastic energy converter; sunlight streams in and warms up the interior quickly, providing the perfect little world for your plants. However, during the colder months, we greenhouse owners are ripped apart into two camps - heated and unheated.

In winter there is very little warmth to be had from the sun and in some parts of the country, there may actually be very little direct sunlight. So without heating, gardeners turn to all sorts of methods to try and hold onto whatever warmth the greenhouse has and of course to try to protect tender crops from frost. Bubble wrap is a common solution but for new gardeners, it can be a daunting task. Allow me to take some of that fear away with some more explanation and some practical advice to greenhouse bubble-wrapping novices.

Why Bubble Wrap A Greenhouse?
The purpose of adding bubble wrap is to provide a layer of insulation. But it is best not to go for the average packaging variety, and instead go for horticultural bubble wrap.

Horticultural bubble wrap is not only extra thick but the bubbles themselves are larger and it is these bubbles, or air pockets, that provide insulation. Double glazing works exactly the same way, creating an air pocket between two panes of glass to slow down the transfer of heat and cold. The idea with bubble wrap is to retain any valuable heat in the greenhouse during the day and prevent the greenhouse from being affected by frost at night. This insulation can increase the temperature inside the greenhouse by one or two degrees, so it is not to be sniffed at!

How to Bubble Wrap A Greenhouse
This is best done after the annual clean. Make sure all the glazing is clean, nooks and crannies are clear and a general purge of dirt, pests and disease has been done. Give the greenhouse a chance to air and dry after cleaning. It is important to reduce the moisture inside as once the greenhouse is wrapped, you will lose access to your windows and vents.

Choosing your bubble wrap is important. Packing bubble wrap will offer little insulation and will deteriorate when exposed to the elements and sunlight.

Proper horticultural bubble wrap is thicker and treated so that it withstands UV damage, meaning it will last 2 or 3 seasons. It is important to consider the longevity whilst we all do our best to reduce our single-use plastics.

Now for the fun part. The best way to bubble wrap the greenhouse is to use long continuous sheets, cut and join as little as possible to reduce heat loss. I've found this works best by wrapping horizontally with long lengths from one side of the door, around the greenhouse to meet the opposite side of the door frame starting at ground level. You can secure the bubble wrap as you go with sticky tape or with little plastic greenhouse pegs designed to clip into the channels in your greenhouse frame.

What to Watch Out For

There are pros and cons to this method of insulation, and the most obvious con is that anything covering the glass will reduce the light coming into the greenhouse. The bubble wrap acts as a diffuser stopping direct sunlight and in favour of a much softer (weaker) light.

If you live in an area where sunlight is very reduced in the colder months, this is something to consider to ensure your plants get the appropriate amount of light and you may decide to employ any means of lighting.

Another consideration is that once wrapped, you will lose the ability to access the vents and windows. This means air cannot circulate as well and excess moisture cannot leave the greenhouse. This could cause problems with build-ups of condensation which in turn can harbour moulds and encourage disease, so you do have to be vigilant. You can open the greenhouse door to vent the moisture but it is at the detriment to that hard-won heat.

If you are unsure of the benefits, there are alternatives to wrapping the whole greenhouse. You could try dividing the greenhouse and insulating only one part, or even use bubble wrap to insulate just one staging bench, creating a micro-environment within your greenhouse. Or clever use of propagators or cold frames within the greenhouse can help offer some protection on a smaller scale. For other ways to increase temperature in the greenhouse in an eco-friendly way, Greenhouse interior with bubble wrapping complete

Keeping Your Crops Warm

Why not line the inside of your polytunnel or greenhouse during the winter months with Bubble wrap to help cut down on drafts, but still let some light through. Bubble wrap is essentially a plastic sheet, which has air bubbles and when fitted inside your polytunnel helps to reduce heat loss and also helps to improve insulation. Bubble wrap inside your polytunnel can provide an ideal way of giving a cost-effective solution to your insulation needs. As quoted by Bob Flowerdew "The 'double glazing' and also lagging the inner tunnel with bubble plastic in winter gives remarkable insulation"

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The need to reduce the carbon footprint is necessary because packaging of the flowers for transportation is an important aspect of the value chain, as it also helps maintain the product's integrity till the end. While the stakeholders in Amsterdam, Netherlands have taken the necessary steps ahead of the season, in Africa, Nairobi-based Silpack is doing its part too. It is an active and instrumental part of the packaging industry for flowers and just like any other industry, the Kenyan company was affected with the Covid-19 pandemic. Parit Shah, managing director, Silpack, says the scarcity in air freight capacity has been one of the key impacts of the pandemic, because of which it has brought forward the long overdue shipments by sea, and storage of flowers at origin and destination. This, however, has kept Silpack busy as they participated in numerous projects to provide the necessary and appropriate designs and specifications for the packaging material. He highlights, "There has been the need to carefully select packaging that balances weight to performance. The sky high air freight costs have convinced a lot of exporters to use our Soliq Air boxes to save on air freight." With the continued uncertainty in 2021, Shah thinks it is also the best opportunity for innovation and research in the flower packaging business. "This season has also changed the stakeholders are approaching packaging as there has been a clear shift towards the use of premium packaging products instead of the economical options," he says.

However, with the uncertainty there is an increasing need for forecasting and like many others, Silpack is constantly engaging with their customers to understand if

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they can help them with forecasts and if they are noticing any changes that will be helpful to cater better.

Coming into this season, Amsterdam Schiphol Airport will not only have the support of the Holland Flower Alliance, which includes the airport along with Royal FloraHolland and KLM Cargo, but also the Circular Plastics Alliance. In August 2020, Schiphol Airport and Circular Plastics Alliance partnered with each other to help develop sustainable solutions for flower importers and to make their shipping solutions better. The Alliance has made standardised boxes with the help of recycled plastic and is aiming to reduce importers carbon footprint by 25 per cent and also increase their profitability by 25 per cent at the same time. This has certainly set the tone for the preparations for the African flower season now.

2021 Valentine

It is that time of the year when the air freight industry is buzzing about getting ready to transport flowers from Africa to Europe. However, this is unlike any other year in the recent past because of the Covid-19 pandemic and this time around many cargo carriers not only have the necessity to allocate their resources but also the responsibility to help the world and vaccine manufacturers to combat the pandemic. It is a difficult time for them to make the most of the season but flowers have always held a special place in the lives of people and always manage to bring joy to all. All said, this is the time to get your packaging right.

The Best Implementation of Solar Energy for Rose Growers in Kenya

What is the best implementation of solar energy for rose growers in Kenya? In July, Sam Hogervorst of Greenspark, will have the answer. At a Kenyan rose grower, he will compare four methods of solar mounting - on the ground, on the roof of the farm, on the greenhouse structure, on water - and make a cost-benefit analysis in which the ecological impact is included.

Pros and cons of current implementations

Currently, in Kenya, solar panels are being installed on the ground or on the roof of the farm. “Both have pros and cons. The majority of the growers choose for the installation on the roof since it is the cheapest way. However, the roof of the farm is often not large enough. On the ground, one has more space, but it occupies the available land that can be used for cultivation. On top of that, it is more expensive as a fence is often needed to protect the solar panels from theft.”

Innovative implementations

Innovative implementations, that Hogervorst wants to investigate, are solar panels on water and solar panels on the greenhouse structure. In Kenya, not much research has been done in the field of floating solar panels and particularly not for the greenhouse industry, he explains. According to him, this innovative way of collecting energy will have a lot of advantages. “Several projects have been carried out over the world and ecological speaking, it has proven to be beneficial for the cultivation of roses. When placing the panels on water, there is less evaporation, less algae growth and the panels are being cooled automatically which results in higher yields.”

Another innovative way of implementing solar panels is placing them on the greenhouse structure. “In Kenya, the greenhouses are made of polyethylene. So, in order to place the solar panel on the greenhouse, we aim to place the solar odules on an extension of the upper greenhouse arch. A bifacial solar module will be used to capture radiation from both sides and increase the yield.”

Direct purchase of lease?

On top of finding the best solar panel implementation, Hogervorst will also investigate how growers will invest in this project; direct purchase or lease.

Importance of solar energy among Kenyan growers

Over the year, more and more growers started to become interested in solar energy and the use of solar modules, but what’s the reason? “There are several. First of all, the efficiency of solar modules improves year by year, which makes solar energy more and more feasible. Secondly, Kenya is located on the equator, so solar radiation is high. Thirdly, the power supply of KPLC is unreliable. Sometimes farms have more than 20 power outages per week, then they have to rely on their diesel generator. The diesel is expensive and the impact on the environment is high. And this brings us to the final reason to shift to solar panels; the majority of the flowers go to Europe and in Europe, sustainable production is being valued and becoming more and more important.”

United Selections Show case
Brand New Colours in it's Annual Open Day Event

An open day event has always been an important breeders, solely because this presents a mutually-beneficial platform to both the breeders and the growers to interact and share new varieties that have the potential to fit into the growers' current business plans and beyond. Premier rose breeder; United Selections held their annual open day in January which ran from 12th to 16th January 2021.

The event which was marked by a successful attendance of Kenyan growers was a great way to begin the year for the breeder and growers. In addition to the current commercial varieties, United Selections took the opportunity to showcase their new varieties both in the Standard-rose and Spray roses categories respectively.

Introduction of new varieties

After more than one year of no crowds or meetings, the open day was a great opportunity for the breeder to share with growers their new varieties, namely Novavita, High Key, Pink Sand, and spray varieties like; Golden Blossoms, Fire Blossoms and Speaking Blossoms.

Novavita is a premium white rose, with an impressive length of between 60-80cm, 12-15 days vase life, and with great transport characteristics. The rose is highly productive and maintains the color when fully open. High Key on the other hand which is a bi-color, has an impressive production and equally good vase life. It is the solution to the bicolour search and High Key too will make the colour mix a great success in retail.

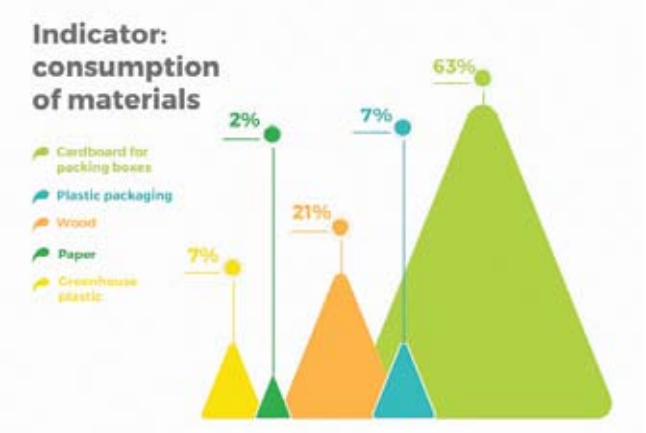
Pink Sand which is also grown in Latin America (Ecuador and Colombia) has a stem length of 50-80 cm. The variety has a great opening and perfectly qualifies as a wedding variety. Lastly, to add to their growing spray assortment, United Selections debuted new spray roses namely; Speaking Blossoms, Fire Blossoms, and Golden Blossoms.

However, the yellow spray rose; Golden Blossoms took center stage because most growers expressed interest in the variety. Its illuminating yellow color not only arouses optimism, resilience and happiness but the variety fits well to the growers' spray-rose needs and the breeder was optimistic that Golden Blossoms will be a great fit to growers' needs for this year and beyond.

A look into the future

The breeder hinted that they will be marking 10 years in March this year since it's inception. This milestone is a great testament to the commitment they have put in, over the years in breeding a colorful future, as evident from different varieties which are greatly appreciated and consumed in the market. United Selections believes that to continuously breed a colorful future, the involvement of growers is necessary at every stage in developing a new variety, this is why they intend to keep developing with the growers. Through their open-door policy, the breeder urges growers to visit their facilities around the world at their convenience for their selection rounds.

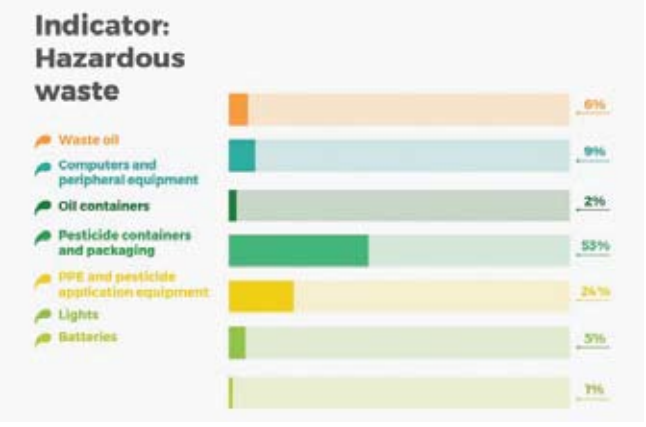
Summary of floriculture sector indicators related to waste generation and consumption of materials for 2018-2019



Indicator: Consumption of materials

The indicators give us an overview of a range of factors, enabling us to make better decisions. This indicators bulletin provides an analysis of floriculture Indicators related to waste generation and consumption of materials.

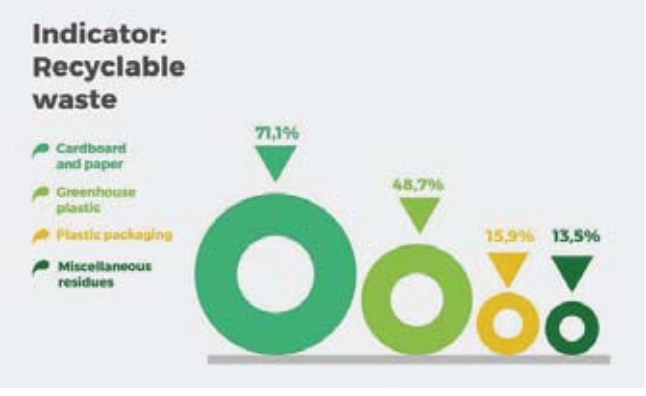
During the period in question the most commonly used material was cardboard for packing boxes followed by greenhouse plastic. The least commonly used materials were paper and plastic packaging. Data collected during the period in question indicate that the sector used an average of 1193 kg of materials per hectare.



Indicator: Hazardous waste

The most common conventional waste products, beyond the obvious plant waste which accounts for 93% of all waste produced, are greenhouse plastic and cardboard. Residues generation, including plastic packing products and paper, were relatively stable across the period in question. During the two-year period 2018-2019, the sector produced an average of 4,183.4 kg of residue per hectare.

Fifty-three percent of all hazardous waste is due to pesticide containers and packaging, followed by personal protective equipment (PPE) pesticide application equipment. The least common hazardous waste products were batteries and oil containers. Data collected during the period in question indicate that the sector produced an average of 8.6 kg of hazardous waste per hectare.



Indicator: Recyclable waste

Cardboard, paper, and greenhouse plastic are the waste products with the highest percentage of re-use. Data collected during the period in question indicate that the sector recycled an average of 149.28 kg of recyclable waste per hectare.

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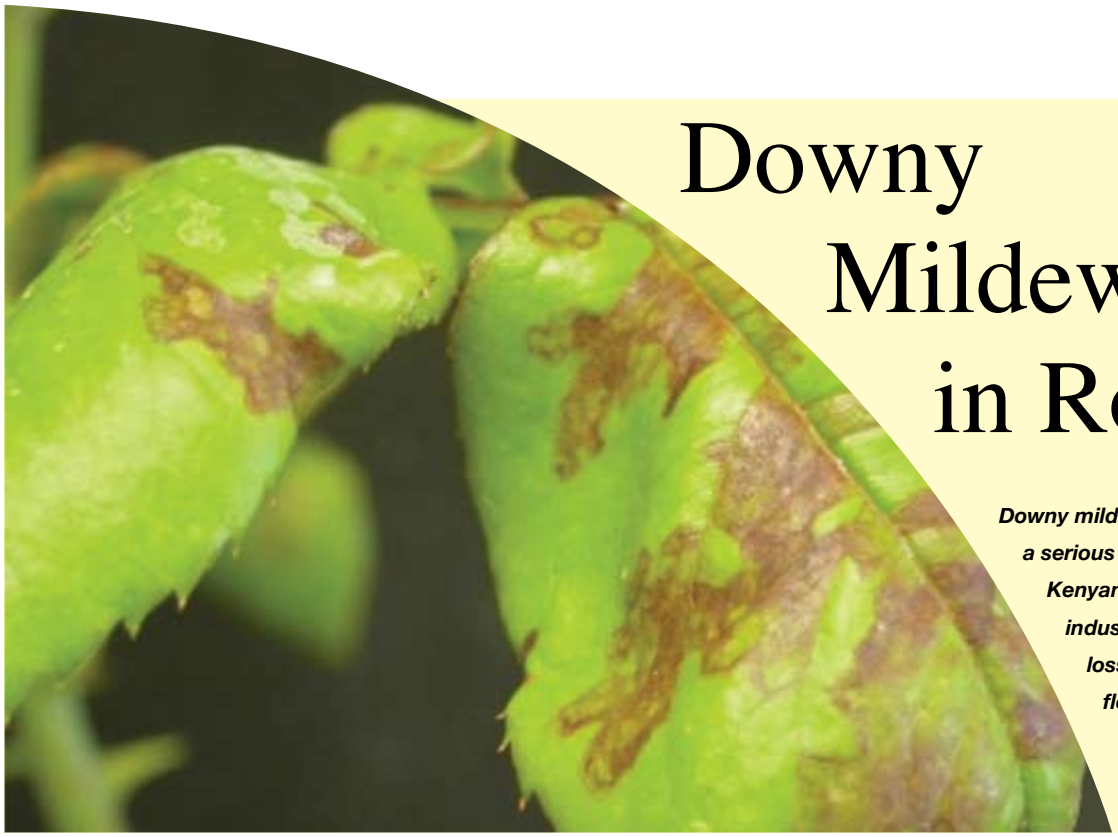


Downy Mildew in Roses

Downy mildew diseases pose a serious problem in the Kenyan horticultural industry causing heavy losses in many floricultural and greenhouse crops, Writes Dr. Samuel Nyalala

Downy mildew is a fungal disease that causes destruction of leaves, stems, and flowers of the infected plant. Downy mildew causal organism is called Peronosporasparsa and as the scientific name indicates, the production of spores is sparse and therefore this disease is difficult to diagnose and control.

Peronospora sparsa, is a fungus-like eukaryotic microorganism (oomycete), more closely related to algae than to fungi. P. sparsa is an obligate parasite that establishes long term feeding relationship with rose plant and its growth depends on the living plant tissues.

Downy mildew (Oomycete fungi) are referred to as a high risk pathogens because of the following factors;

- Oomycetes fungi are able to spread in an explosive manner under favorable conditions.
- Short development cycle (8-10 days under optimum conditions)
- High potential for reproduction (high quantities of spores)
- Wide propagation by water and wind
- Damage is not reversible: The damaged tissues die in general leading quickly to substantial losses at harvest
- High genetic variability: Rapid appearance of strains less sensitive to specifically acting fungicides possible.

The pathogen grows between the host cells and invades the plant tissues by producing nutrient-absorbing structures called haustoria. Spore production and infection occur during extended periods of cool and humid weather: The sporangiophores and sporangia appear on the lower leaf surface. A complete life cycle can occur in 72 hours. The pseudo fungus penetrates the host through the cuticle and epidermis, and feeds on parenchymal cells via haustoria and intercellular mycelium profuse network.

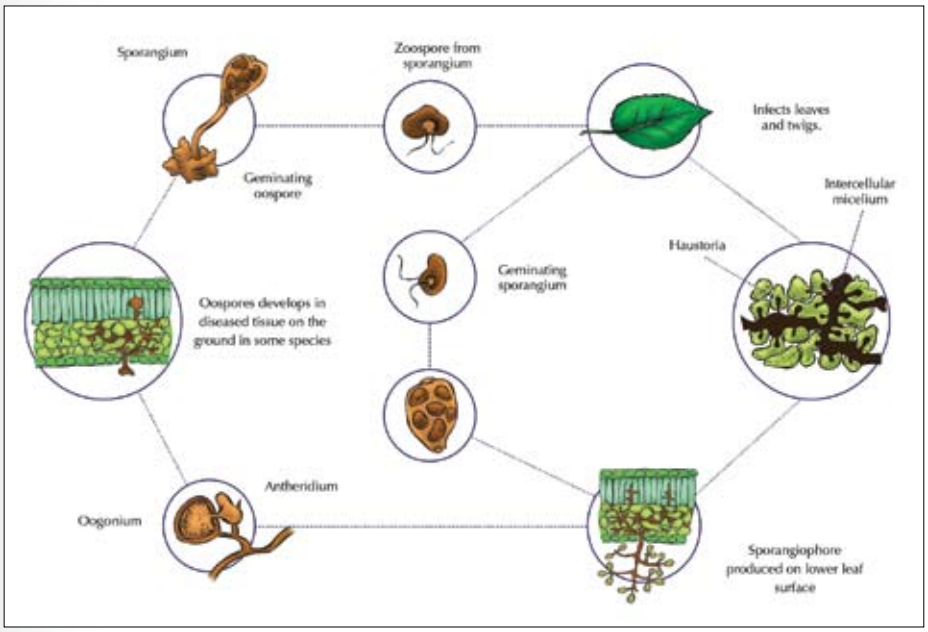
As the infection progresses, sucrose and other nutrients move from the leaves to new infection zones originated by localized injuries. When sporangia are mature, they spread by the wind to developing foliage and flowers. Symptoms usually develop within 10 days after infection, with sporulation occurring 5 - 10 days later.

P. sparsa has been detected in the cortex of stems and root tissues of symptomatic plants and crown tissues of a symptomatic mother plants used as a source of propagation material the disease therefore starts on bare-rooted, apparently healthy stocks and infect new stems and emerging leaves as they develop.

Downy mildew pathogen thrives best under conditions with 90 - 100% humidity and relatively low temperatures (10 - 24°C). Therefore, rose downy mildew occurs mainly in greenhouses, rather than outdoors. High-risk seasons with a downy mildew incidence >10% coincided with months when the number of hours per day with temperature of 15 - 20°C

averaged >9.8 over the month and the number of days with rainfall in the month was >38.7%. The disease starts as small angular yellow spots or chlorotic lesions on the upper surface of leaves These lesions quickly turn into red, purple or dark brown blotches, which are surrounded by a chlorotic halo.

On the underside of the leaves, the signs of the pathogen include occurrence of a light brown mycelium with abundant production of sporangiophores and sporangia, creating hairy appearance. On the stems and Calyx, the disease manifests as dark purple spots that vary in size and may even coalesce inducing death of branches and mummification of flower buds. Foliar symptoms of the disease



are usually mistaken for abiotic stresses such as burns or pesticide phytotoxicity, rendering correct diagnosis difficult.

Greenhouse management: Maintaining low humidity levels and avoiding sudden temperature drops during the night is the most effective way to prevent downy mildew epidemic.

What factors favour these conditions?

- Type of greenhouse
- Crop type and density
- Drip irrigation
- Nutrition status
- Human activity; prunning, scouting, spraying, harvesting etc

Disease Management

Cultural Control

- Destroy rose debris from previous crops — spores can overwinter in leaves and canes, then the downy mildew can attack new plants.
- Try to water early in the day or whenever leaves will dry quickly, to ensure dry foliage at night
- Even though fans might move spores, you should use them along with venting to reduce humidity and leaf wetness
- Hungry plants are more susceptible to downy mildew. Maintain a balanced fertility program to protect your crops
- Space plants to allow rapid drying of leaves. If the leaves are very touching, the canopy closes in and the humidity increases.
- Use resistant varieties for low maintenance plantings

Chemical Control

Chemical control of downy mildew in roses should be based on the recommendations of the Fungicide Resistance Action Committee (FRAC).

Choosing the most effective fungicides to prevent or eradicate rose downy mildew can be tough. Downy mildew requires a well-managed chemical spray program starting early with a rotation of chemicals for prevention. Rotation of fungicides from different chemical groups to avoid development of resistance by the pathogen. Fungicides for use against downy mildew can be categorized as either preventive, early or late curative products.

The disease also overwinters in the crop that was infected in the previous season. The fungus may overwinter in stems as dormant mycelia without oospores. This is the primary inoculum of the disease and upon reaching the favorable conditions, the disease infects new stems.

The preventive fungicides (mancozeb, propineb, copper compounds etc) must be applied before an infection period begins. New growth following application will not be protected.

Early curative products work against spore germination, sporangia elongation and penetration while “Late curative products” deal with intracellular infection level (by this time symptoms are visible to the eye).

Crop nutrition: Nutritional elements such as nitrogen (N), potassium (K), calcium (Ca), boron (B), Silicon (Si) and nutrients ratios such as N: K ratio are important in increasing resistance to obligate parasites like P. sparsa.

Biological control: Use of Bacillus subtilis as a rotation in a management program of P. sparsa.

Dr. Samuel Nyalala, Department of Crops, Horticulture and Soils, Egerton University shares in sights on the disease. Additional reports by Maurice Koome and Simon Kihungu

Agrichem Africa Ltd Sponsors High Perfor

On 20th February 2021, Agrichem Africa Ltd sponsored its first Lawn Tennis tournament for juniors. The event provided an opportunity to appreciate and engage the community. In attendance was Agrichem Africa Ltd Managing Director Mr. Shiraz Karmali.

The winners took home a trophy and a certificate.

Other than children getting a fun in the Lawn Tennis course, prospecting future international champions interacted freely with international coaches and fellow competitors.

The one day junior Lawn Tennis tournament held at the Oshwal Sports Complex brought together over five teams and individual players. “The competition which was divided into under 12, under 14 and under 16 brought together children from all over the country.

The event known as the Agrichem high performance open 2021 attracted junior players from the Kibera slums and Agrichem Africa Ltd sponsored them fully. “When we realised there are children in Kibera who play Lawn Tennis but may not afford, we decided to sponsor them. We paid their transport, registration fees, uniforms, lunch and court fees”, says Mr. Shiraz. Adding, “We needed to give them exposure and allow them to compete with others to know their level of play”.

Speaking to Mr. Shiraz Karmali of Agrichem Africa Ltd during the event, he promised to hold a similar tournament later in the year for seniors and heeded to calls by the organisers to sponsor a similar event next year.

Mr. Shiraz underscored the role of sports in the overall growth of the youth and promised to continue supporting the event in future. “We recognize the vital role that sports plays in the overall growth of our youth by imparting discipline and focus among the youth, we encourage the youth to continue with this positive culture,” said Mr. Shiraz. He said the company will allocate more resources to Lawn Tennis to identify and nurture talent. “We will also seek more support from other partners with

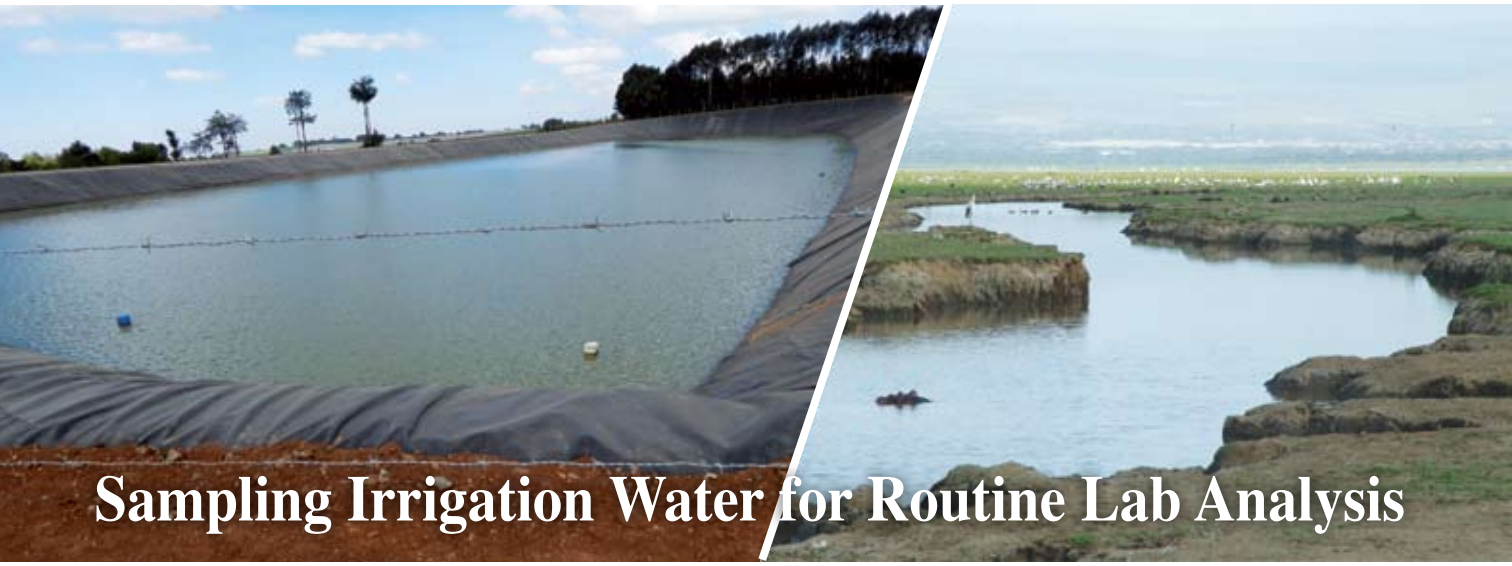
mance Open 2021 Lawn Tennis Tournament

similar ideologies on behalf of the organisers," said Shiraz.

Mr. Shiraz decried that talents of youths are being wasted due to lack of sponsors to make them more competitive. He called on the government to grow sports in the county and highlighted the support that had seen emergence of talents in the tournament.

The competition was followed by an award ceremony and Mr. Shiraz commended the teams, players and their coaches for saving their time and committing their talents in order to make the day a success for junior lawn tennis players and invited guests. He acknowledged that, there is enough talent in the country recommending any company to come out and help nurture them. He appreciated the parents for allowing their children to honour the invitation to the interactive event. He commended the coaches that assisted in putting together the event citing that anything worth great ending takes a great team.

Mr. Hilary on behalf of the other coaches and organisers called on more companies to invest in Lawn Tennis. He thanked Agrichem Africa Ltd for their sponsorship. "Companies should embrace sports sponsorship investment culture as other cultures are now slowly fading and not as lucrative", said Mr. Hilary. He added that, they should partner with Kenya open Lawn Tennis Association so as to enjoy the competitive return on their investment.



Sampling Irrigation Water for Routine Lab Analysis

Irrigation sampling is an important nutrient monitoring practice to determine water quality. Routine lab analysis is often performed to evaluate pH, electrical conductivity (EC), alkalinity, and available dissolved nutrients. Assessing irrigation water quality will help refine alkalinity neutralization and fertility programs and define limited or excessive nutrients for the appropriate corrective procedure.

On a recent greenhouse visit, I discussed with a farm manager the crop history, environmental conditions, and cultural practices. I learnt that they rarely perform irrigation water analysis. It's not uncommon to come across instances where crop maintenance and production takes precedence over nutritional monitoring such as irrigation water sampling. However, sampling and assessing irrigation water is an important nutrient monitoring practice to determine water quality or chemical condition.

In general, a standard water quality analysis determines pH, soluble salts [referred to as electrical conductivity (EC)], and alkalinity or carbonates, bicarbonates, and hydroxides. In some instances, levels of dissolved nutrients such as N, P, K, Ca, Mg, S, Fe, Mn, B, Zn, Cu, Mo, and Cl may be included or for an additional fee. Irrigation water should be assessed at least annually or more frequently depending on the crop, cropping cycle and system.

Evaluating irrigation water is important because water quality varies by geographic location, time, water source, well depth, and rainfall events. For example, in geographic regions of the United States where irrigation water is drawn from aquifers, alkalinity may be elevated due to the concentration of carbonate, bicarbonate, and hydroxide anions in the water. For this reason, growers located in these geographic regions are often challenged with substrate pH drift because alkalinity in irrigation water has the greatest effect on substrate pH rise than water pH. To mitigate the effect of alkalinity on substrate pH, neutralization or acidification is needed. Therefore, water quality analysis will help determine the need to determine alkalinity levels and refine alkalinity neutralization and fertility programs. Water analysis will also define limited or excessive nutrients dissolved in irrigation water that may manifest into nutritional deficiencies or toxicities and aid in the identification of the appropriate corrective procedure.

1. Turn on irrigation and allow water to run for five minutes to clear the line of impurities.
2. Label an analytical lab issued or a clean, small plastic container with your name and/or operation name, address, water source, and analysis requested.
3. Rinse the plastic container two to three times with the irrigation water to be sampled.
4. Fill the container with the irrigation water and cap tightly.
5. Provide all requested information on lab issued documents and ship the irrigation water sample within 24 hours.

Please note, before sampling, contact your preferred analytical lab to obtain sampling and submission procedures. To obtain consistent results and detect trends overtime, follow the same sampling procedure every time you sample. Most times, sampling procedures or guides are available online or upon request.


KORDES ROSES
East Africa

Bees: Giving back to the environment and Critical for our food

How does the future look for our favorite insects?

Insects are pretty amazing, but do you have a favorite? We caught up with an entomologists, and passionate wildlife fanatic, with many years of experience in his field, to learn about the bugs he cherishes the most. What is his favourite, and how did he get started on the amazing journeys that has led to him becoming respected expert in subject he loves?

It was an opportunity to find out his views on the future challenges faced due to global warming, which is not just affecting our existence as humans, but also influencing how bugs and insects will live and survive. What is the role of the agriculture sector?

Why is the honey bee your favorite?

Entomologist: "These hardy little creatures pollinate one third of the fruits and vegetables we eat and, like those in the agriculture supply chain, they work together to put nutritious food on our tables." What other insect gives so much back to us and the environment, without taking? I think they are an example we should all follow.

Honey is a wonderful food that bees make for themselves, and then they share it with us. But it's just a by-product of honey bees visiting flowers to collect nectar.

How did you initially become interested in pollinators?

Entomologist: I was clearly an entomologist at heart by the time I was five, but I didn't know it until college. I studied entomology in various systems, and I took my first honey bee course.

From there, doors kept opening in the bee world and since then I have done a wide variety of work in many places with honey bees, including the USA, Canada and France. Now I run a non-profit organization that supports honey bee health research and puts pollinator forage back in agricultural landscapes.

Other than my great wife and family, it's the best thing I ever did. It was phenomenal and I immersed myself in this world of honey bees. It consumed me. Now I study bees, and I have travelled the world on behalf of honey bees.

What do you see as the most pressing challenges affecting honey bees?

Entomologist: The 4P's: Parasites, Pathogens, Poor Nutrition and Pesticides.

The main parasite is Varroa destructor, a mite introduced from the Asian honey bee species that will kill our honey bees if not treated. "Like a flea on a pet dog, it attaches itself to a honey bee and feeds on it. But unlike a tiny flea on a large dog, this is a mite on another insect if you will. It vectors pathogens that debilitate colonies until they die. It's probably the leading cause of death in honey bee colonies.

To put it into perspective: make a fist. Put your fist someplace on your body. Your fist is the Varroa mite and your body is the honey bee's body. It's a huge mite compared with its host. It feeds off the bee, transferring viruses, leaving open wounds and causing immune suppression."

Poor nutrition, if you're a bee, means there aren't enough flowers. Urbanization, consolidation of agriculture and modern growing practices are reducing the natural support for bees on the landscape.

Modern practices also expose bees to more pesticide chemistry in each crop they visit to pollinate. If enough bees don't survive, there is no substitute for that pollination service.

Why are innovative partnerships so critical for addressing pollinator health?

Entomologist: Pollinators are critical for our food supply, and partnerships are critical for supporting both. An association to bring together beekeepers, growers, researchers, government agencies, agribusinesses, conservation groups, and

consumer brands to improve honey bee health in general and around production agriculture systemsshould be formed. By working together, these stakeholders can identify, implement, and raise awareness of the challenges facing bee health and how to address them. It is quite a group, and should work hard to bring stability back to beekeeping and the vital industry they are a part of.

What role should the plant science industry play in protecting pollinator health?

Entomologist: Around 30% of the food we eat is the result of a honey bee performing this pollen transfer task. It is a whole connected system that supports the environment.

Honey is a wonderful food that bees make for themselves, and then they share it with us. But it's just a by-product of honey bees visiting flowers to collect nectar. More importantly, in doing so, they transfer pollen (male element) to another flower part (pollination) so that a seed embryo can be fertilized. This allows the seed to form and the plant to build, and the fruit to grow – sometimes for our food.

I would like to see more value placed on balancing how we manage land for biodiversity. Modern precision ag tools can help soften the edges, reduce prophylactic use and adhere to integrated pest management (IPM). These tools can allow farmers to incorporate some natural habitat into every farm, where it makes sense. If done correctly, it may even increase ROI.

The plant science industry has innovation at its heart and is an important partner in agriculture. It's important for it to be at the table with other bee health stakeholders to share information and find collaborative solutions. It can also play an effective role in helping to create, implement and disseminate practices that support bee health, as well as helping to drive innovation and research into the management of crop pests while safeguarding pollinator health.

These hardy little creatures pollinate one third of the fruits and vegetables we eat, working together to put nutritious food on our tables.

You have Mentioned of Varroa mite. Are the agriculture industry's efforts to respond working? Can you see this being tackled

Entomologist: There are still successful commercial beekeepers, but the risk of failure is high, and the consequences would have a ripple effect on many crops that depend on these pollination contracts. When colonies go into cold season, nobody knows how many will come out alive. If enough bees don't survive, there is no substitute for that pollination service.

Varroa mites are bees' most pervasive pests and it takes consistent and expensive monitoring and management for bees – and beekeeping operations – to mitigate against and survive infestations. If you don't have Varroa now, you will most likely have them within a year, and that creates an ongoing challenge for beekeepers of all scales.
We are optimistic about bee health and the resiliency of our agricultural systems. However, much work still needs to be done to address Varroa mites and other bee pests and diseases.

Many researchers are exploring innovations including those related to genetics. We hope a combination of various tools will provide effective options for beekeepers.

Are you optimistic about its Future

Entomologist: Yes! Bees and beekeepers are both very resilient. And just like the beekeepers who work tirelessly to deliver healthy bees ready to pollinate our food, some entomologists work every day to make sure we are on our way to the next best practice and the next knowledge breakthrough, and that we are attracting the best advances in science to focus on solving problems for bees.

Hope for Exporters as KQ Launches Cargo Preighter

Kenya Airways launched a first-ever cabin cargo repurposing of a Boeing 787 into a "Preighter". The term preighter was coined at the height of the pandemic last year to refer to passenger aircraft converted to cargo.

This has been made possible through a partnership with Avianor, a leader in the aerospace industry for more than 25 years. Through the partnership, the team repurposed its aircraft cabins into cargo transportation on the Boeing 787.

This joint effort is a worldwide breakthrough as it is the first ever cargo repurpose of this type to be performed on the Boeing 787, demonstrating Kenya Airways and Avianor's role as trailblazers in the aero industry. The repurposed cabin has been certified to carry up to 16 tonnes of cargo, potentially enabling the aircraft to reach its maximum payload while in cargo operation of 46 tonnes. The repurposing began in December 2020 and was completed in January 2021.

This joint effort is in response to the growing demand and need for increased cargo capacity.

"KQ's purpose is to contribute to the sustainable development of Africa. The preighter will enable us to bridge businesses & enhance connectivity. Kenya will export more goods to our partners across the globe & stimulate business for local suppliers," said Allan Kilavuka, CEO and MD of Kenya Airways.

"This will have a 360 degrees impact on Kenya exports. It is a game changer that will lead to improved market access by ensuring that Kenyan products reach intended markets faster," said Kenya Export Promotion and Branding Agency CEO Dr. Wilfred Marube.

Dr. Marube noted a 5.7% growth in exports trade between November 2019 (KES 530B) and November 2020 (KES 583B) partly because of Kenya Airways especially during the pandemic when they converted some of their passenger planes to cargo during the pandemic.

"Such collaborations and synergies is what will keep the Kenyan flag high on the global

market. As an Agency, this is timely even as we prepare for the country's participation in a global Expo Dubai 2020 which will run from October 1st 2021 to March 31st 2022. The Preighter will help facilitate and showcase the best of Kenyan goods and services to the world," he added.

Kenya Airways reiterated KQs commitment to growing cargo business and creating more opportunities geared towards growth of the economy.

"We are excited to be part of the first ever certified cargo conversion of this type on the Boeing 787 aircraft. It demonstrates our agility, innovation and quick thinking as well as increases our cargo capability and capacity to keep essential goods moving across the globe. Kenya Airways will keep playing its role as a catalyst for economic growth in the continent, by connecting the world to Africa, and Africa to the world for both our Cargo and Passenger customer segments," he said.

Speaking at the occasion, Okisegere Ojepat, CEO of Fresh Produce Consortium of Kenya (FPC Kenya), said, "The horticulture sector's contribution to Kenya's economy cannot be downplayed. It is a major foreign exchange earner and provides employment opportunities to about 350,000 directly and supports over six million livelihoods."

While speaking at the launch, Kenya Airports Authority's MD, Alex Gitari noted that it will continue to support the air cargo industry by providing the requisite infrastructure and facilities within our network of airports.

In 2020, Kenya Airways used some of its B787 aircraft for cargo transportation, aircraft seats remained, limiting the space for an increased freight capacity. Avianor with its expertise supervised Kenya Airways' modifications on the full cabin repurposing of two of their B787s.

"We are proud of this achievement. This and other events point to the rebound of the aviation industry and are a testament to its ability to innovate in the face of one of the hardest challenges faced by humanity. This development is a bold step for Kenya Airways," stated James Macharia, cabinet secretary, ministry of transport infrastructure, housing and urban development.

"Avianor's team has been pioneering the main deck temporary cargo repurposing process in response to the need for rapid increase in air freight cargo capacity at the onset of the pandemic. We are very excited to now be working with Kenya Airways to adapt this solution for their 787 aircraft. This represents a unique design and certification challenge, and we are thrilled to demonstrate, once again, our ability to find unprecedented solutions to customer needs," said Matthieu Duhaime, president and CEO Avianor.

On his part Gilbert Kibe, director general Kenya Civil Aviation Authority (KCAA), commended Kenya Airways for taking a bold innovative step to address the need for additional capacity for cargo and facilitating trade even as the aviation industry recovers through a difficult period.

"As passenger numbers are at an all-time low, airlines have had to look for alternative means of revenue to stay afloat. This project is economically significant as it will retain and create new jobs as well as support Kenya Airways in its recovery efforts to diversify revenues." said Kibe.

How Does Humidity Influence Crop Quality?

Humidity can be the most difficult environment factor to control in greenhouses. Even the most sophisticated environmental control equipment cannot perfectly control the humidity level in greenhouses. Humidity levels fluctuate with change in air temperature and plants are constantly transpiring, which adds water vapor to the air. In the northern climatic areas, these challenges are multiplied by many factors, of which the drier, outdoor air that is too cold to perform air exchanges.

Humid air directly contributes to problems such as foliar and root diseases, slow drying of the growing medium, plant stress, loss of quality, loss in yields, etc. Therefore, more pesticides are needed for disease control and plants tend to have weak, stretched growth making the plant less desirable.

If the humidity is too low, plant growth is often compromised as crops take much longer to obtain the saleable size. Also, lower leaves often drop off, growth is hard, and overall quality is not very good. Whether the humidity is too high or too low, the loss of quality reduces the selling price of crops and increases production costs, both of which reduce profits.

Measuring Water Loss From the Plant

Humidity is the amount of water vapor in the air. The maximum amount of water vapor held by the air is dependent on the air temperature (warmer air holds more water than colder air) and, to a lesser extent, the air pressure. When we refer to air moisture, we normally express it in terms of relative humidity (RH).

This is because the absolute amount of water that can be held by air is constantly fluctuating with temperature. The relative humidity is expressed as the percent water vapor in the air in comparison to the total amount of water that could be held by the air if it were saturated. This RH is the most common way of expressing humidity levels, but it does not express plant water loss.

Vapor pressure deficit (VPD) is more accurate when determining water loss from the plant. VPD is simply the difference between the vapor pressure inside the leaf compared to the vapor pressure of the air. If the VPD is high, meaning that the vapor pressure inside the plant is higher than the outside air, then more water vapor escapes out through the stomates (pores in the bottom of leaves).

This process of water loss through the leaves is called “transpiration”. If the VPD is low, the stomatal openings close and little water and fertilizer is taken up by the plant from the growing medium. VPD is important to know because it is used to schedule irrigations, to determine if air exchanges are needed and if air temperature needs to be increased in order to hold more moisture.

This VPD has been integrated into many greenhouse environmental control systems to manage humidity and for scheduling crop irrigation. Now, how does this apply to a crop?

Role of Humidity in Plant Growth

Plants are always adjusting their leaf stomatal openings based on the VPD and the humidity in the air. High humidity is a problem because water usage by the plant is too slow and compromises quality, even though the stomates are constantly open. Likewise, if humidity is very low and subsequent transpiration is too high, the plant closes its stomatal openings to minimize water loss and wilting. Unfortunately, this also means photosynthesis is slowed and subsequently, so is plant growth.

As alluded to above, the two major functions of the plant that tie in closely with the humidity in the air and affect crop performance are

transpiration and photosynthesis.

The Plant Transpiration Process

This is the process where plants absorb water through the roots and then give off water vapor through pores in their leaves. The drier or the hotter the air temperature, the faster the transpiration rate from the plant. However, the moisture deficit and transpiration rate are not directly related. This means that in very dry air, the increased rate of transpiration can only go so high in the plant and then it begins to wilt. For example, if the air is extremely dry, but the growing medium has enough water, the plant may wilt and, unless the humidity increases, the plant could die.

On the other hand, if the air is very humid the plant does not take up much water from the growing medium, which also means there is little uptake of fertilizer elements. This is a problem for some elements, particularly calcium, as inadequate uptake can lead to nutrient deficiencies.

Also, low water usage from the growing medium often correlates with climbing growing medium pH, which makes micronutrients such as iron unavailable to the plant. Typically, these problems are seen in the winter and early spring, when air temperatures in the greenhouse are low and transpiration is inadequate, or during the hot, humid months.

The Photosynthesis Process

This is the process of fixing carbon dioxide and water in the plant leaves to produce sugars that are used for energy and growth. When the temperature is high and humidity is normal, more stomates will open, letting in carbon dioxide for active photosynthesis. If the air is excessively dry and the plant is wilting, the stomatal openings close, thereby reducing photosynthetic activity and ultimately plant growth. The quality of the crop is dependent on the conditions that promote optimal photosynthesis and humidity plays a role in this process.

Plant Responses to Humidity

Humidity Too Low	***Humidity Too High***
Wilting	Soft growth
Stunted plants	Increased foliar disease
Smaller leaf size	Nutrient deficiencies
Dry tip burn	Increased root disease
Leaf curl	Oedema

How to Reduce Humidity in the Greenhouse

It's important to maintain a certain level of humidity in the greenhouse, but not to the point where it reaches the dew point. If the temperature in the greenhouse is at or below the dew point, the air cannot hold its moisture and starts to condense on the greenhouse, covering glazing and leaf surfaces. Water on leaves greatly increases disease problems and minimizes

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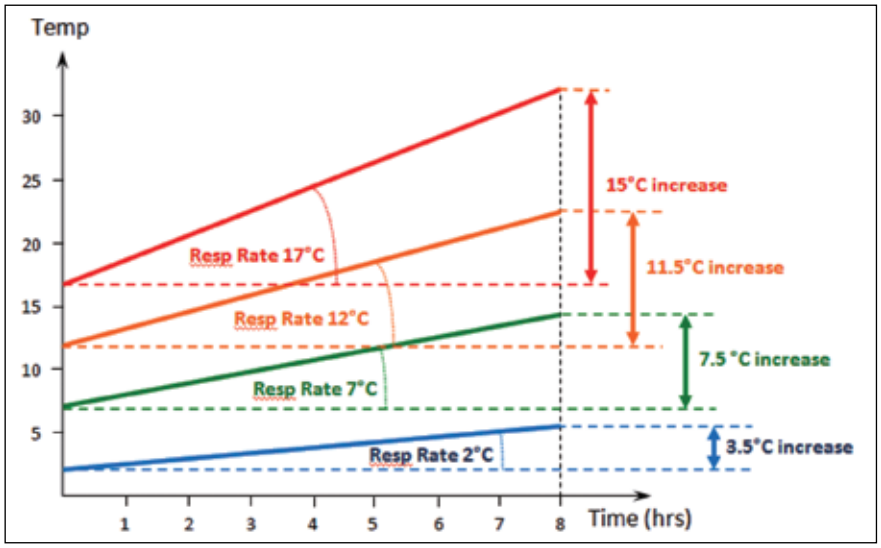
water uptake by the plant, increasing nutritional problems.

Sometimes it is difficult to keep the temperature above the dew point, because the air in the greenhouse is very humid, especially during cold months when air exchanges is limited. It is also a challenge as the greenhouse glazing is often cold due to frigid outside air so the moisture in the warm, humid internal air will condense on the inside of the greenhouse.



Dripping becomes a major concern, even when the RH is adequate, as it causes uneven crop drying and increases diseases. The use of air flow devices and heating the air greatly helps, but RH can still be high enough to form condensation on cold surfaces.

An Infrared radiant heating system may help reduce condensation since it raises the temperature of hard surfaces, such as the plant and growing media surfaces, but not the air so there is less temperature variation between the inside and outside air. Keeping the air temperature more uniform throughout the greenhouse by using fans and thermal screens, avoiding sudden temperature fluctuations, and adjusting irrigation practices based on the greenhouse environment and weather are all good methods to manage humidity and to reduce condensation in the greenhouse.

How to Add Humidity in the Greenhouse

Humidity can be added, especially in propagation houses or when the air is too hot and dry, but it must be done without causing water to puddle on the floor or condense on the leaves or other surfaces in the greenhouse. This requires evaporative devices such as misters, fog units or sprinklers, which add water vapor to the air in order to reduce water loss through the leaves of unrooted cuttings or plants that are under extreme heat and low humidity conditions.

Evaporative devices accomplish three things:

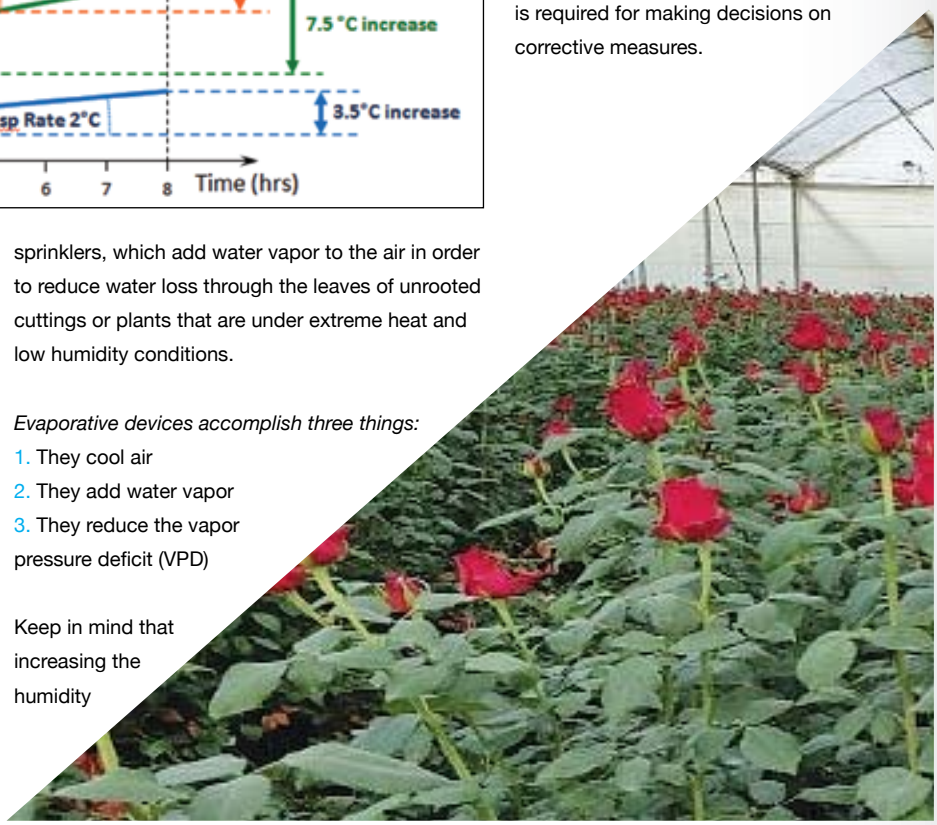
1. They cool air
2. They add water vapor
3. They reduce the vapor pressure deficit (VPD)

Keep in mind that increasing the humidity reduces the frequency requirement for irrigation. This has to be taken into account when watering a crop in the greenhouse.

Using a growing medium that has high water retention without causing asphyxiation is beneficial when the growing medium dries out too fast due to low humidity.

The good news is that for most growers that have issues with high humidity, it can be corrected at relatively low cost without having to acquire equipment to alleviate high humidity levels in greenhouses. However, if the humidity in the greenhouse is too low, using a good fogging system or evaporative devices that procure more humidity is mandatory, especially in propagation houses or the southern areas where drought and high temperatures prevail.

In both cases, good environmental control equipment in critical areas in the greenhouse is required for making decisions on corrective measures.



FSI 2025: Enhancing Sustainability In Floriculture

Building on 2020 achievements, FSI members outline new and ambitious objectives for 2025

Floriculture Sustainability Initiative (FSI): a vision for more sustainable floriculture FSI multistakeholder members, including producers, traders and retailers have set ambitious aims with a bold strategic plan for enhancing responsibility and transparency within the floriculture supply chain by 2025.

Milestone achievements pave the way for further progress

We have a lot to celebrate. Compliance, transparency and consumer awareness of sustainability in floriculture have improved, accompanied by more stringent market and legal requirements, globally. Many challenges have been felt across the entire supply chain since the 2020 pandemic, but simultaneously, we have also seen accelerated innovations in digitalization, robust data collection practices and multilateral decision-making further enhancing the resilience of the sector.

Against this backdrop, FSI and its members, recognise that efforts must continue to reinforce a supply-chain where current and future sustainability issues can be tackled at sector level, in line with the United Nations' Sustainable Development Goals (SDGs).

"Sustainability is an essential part of business, and the FSI 2025 strategy contains the components which are needed to let the sector become a solution to the current challenges." Erling Ølstad, Mester Gronn CEO.

Launching FSI 2025

FSI started in 2013 as a market-driven initiative, aligning international floriculture stakeholders to collaboratively drive sustainable production and trade. By 2020, FSI and its members managed to reach collective milestones in terms of responsible production and trade, innovations and best practices. Building on these achievements, the FSI 2025 ambition will promote transparency and a responsibility in the floriculture supply chain, by way of responsible production and trade, responsible conduct, and integrated reporting. To set these wheels in motion, and following on from the FSI General Assembly 2021, held on Tuesday 2nd February, FSI members already intend to pledge ongoing support for various groundbreaking sustainability initiatives.

Under these three pillars, FSI members have set four main objectives to hit by 2025. They include:

1. The broadening of the 90% responsibly produced and traded volumes ambition to include new environmental and social criteria;
2. A reduction of the carbon footprint for selected products;
3. A Reduction of the living wage gap of workers at farm level;
4. Encouraging FSI members to report on progress and integrate due diligence reporting.

Formulating FSI 2025: co-creation through consultation and working groups

During the recent evaluation which looked at the progress made towards the first milestones and initiating the 2025 strategic review, the FSI Board and members were consulted on their individual and collective outlook of what sustainability would look like beyond 2020. Through these members' consultations, meetings and working groups, they invested their time and knowledge into formulating the FSI 2025 vision and objectives. FSI would also like to express special thanks to IDH, the Sustainable Trade Initiative for its ongoing support in this process.

Members recognise that the strength of FSI is to bring a sharing mindset to the table, allowing the sector to share knowledge and co-create on joint solutions. FSI will remain a neutral and not-for-profit organisation, in which members maintain ownership for the implementation of their common 2025 ambition. Through our collective responsibility and proactivity, we aim to set a new direction for a more forward-thinking floriculture sector which contributes towards a better future for our planet and our people.

Water Alkalinity vs pH - What's the Difference?

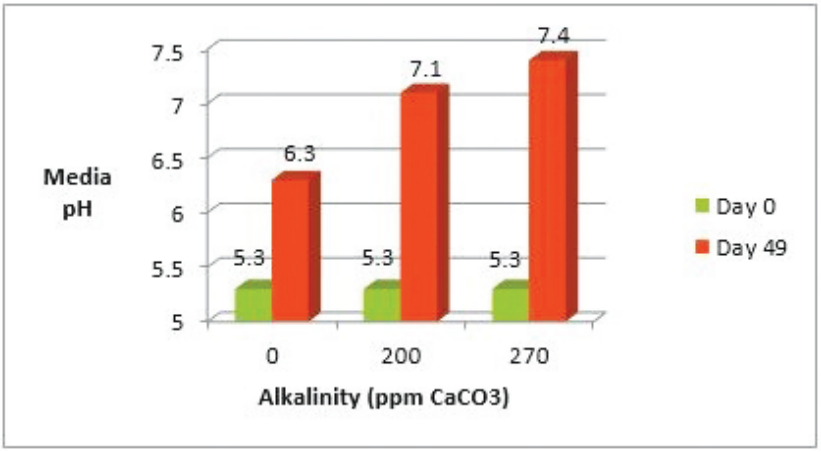
Water alkalinity and pH are not the same. Water pH measures the amount of hydrogen (acid ions) in the water, whereas water alkalinity is a measure of the carbonate and bicarbonate levels in water. Think of carbonates and bicarbonates as dissolved limestone. The higher the alkalinity of the water, the more lime it contains and therefore, the more rapidly the water can cause the growing medium pH to rise. On the other hand, the pH of the water does not have any influence on the pH of the growing medium.

Starting Water pH	Water Alkalinity (ppm CaCO3)	Sulfuric Acid Required to Reduce Water pH to 5.0 (ml)
9.3	71	1.2
8.3	310	6.0

For example, the chart above shows the starting pH of two water sources and the amount of acid required for each to reach a pH of 5.0. The water with the higher pH did not require as much as acid as the one with the lower starting pH. At first glance, this may not make sense. However, note the alkalinity in the center column. Regardless of the starting pH, the higher the alkalinity of the water source, the more acid is required to reduce pH to 5.0. For all water sources, it is the alkalinity that actually determines how much acid to use, not the pH.

How does water alkalinity influence the pH of the growing medium?

The higher the alkalinity of the water source, the higher the pH of the growing medium. It is clear that the pH of the water and the alkalinity are not the same. In fact, the pH of the water does not dictate the pH of the growing medium, but in fact it is the alkalinity of the water source that influences the pH of the growing medium. This is important for growers to know, since alkalinity has significant impact on growing medium pH, when choosing the correct fertilizer(s) and/or injecting acid.



Understanding Soil Acidity

Soil acidity is the term used to express the quantity of hydrogen (H) and aluminum (Al) cations (positively charged ions) in soils. When levels of hydrogen or aluminum become too high—and the soil becomes too acid—the soil's negatively charged cation exchange capacity (CEC) becomes "clogged" with the positively charged hydrogen and aluminum, and the nutrients needed for plant growth are pushed out. Acidic soils create production problems by limiting the availability of some essential plant nutrients.

Below soil pH 5.5 (pH is the measurement of soil acidity. The lower the pH, the higher the soil acidity), aluminum may be concentrated enough to limit or stop root development. As a result, plants cannot absorb water and nutrients, are stunted, and exhibit nutrient deficiency symptoms.

Factors Causing Soil Acidity

Rainfall and leaching: Soils usually become acidic under heavy rainfall. This is because rainwater is slightly acidic (about 5.7) due to a reaction with CO2 in the atmosphere that forms carbonic acid. As this rainwater passes through soil pores, it leaches basic cations from the soil as bicarbonates, which increases the percentage of Al3+ and H+ relative to other cations in the soil. Root respiration and decomposition of organic matter by microorganisms also release CO2 that increases the carbonic acid (H2CO3) concentration resulting to leaching.

Nitrogen fertilizers: Some fertilizers such as ammonium (NH4+) fertilizers undergo nitrification process to form nitrate (NO3–), and during this process, H+ ions are released leading to acid soils. The more ammoniacal nitrogen fertilizer is applied, the more acidic the soil gets.

Parent material: Due to differences in chemical composition of parent materials, soils will become acidic after different lengths of time. Thus, soils that developed from granite material are likely to be more acidic than soils developed from calcareous shale or limestone.

Organic matter decay: Decaying organic matter produces H+ which is responsible for acidity. The carbon dioxide (CO2) produced by decaying organic matter reacts with water in the soil to form a weak acid called carbonic acid. Several organic acids are also produced by decaying organic matter, but they are also weak acids.

Crop production: Harvesting of crops has its effect on soil acidity development because crops absorb the lime-like elements, as cations, for their nutrition. When these crops are harvested and the yield is removed from the field, then some of the basic material responsible for counteracting the acidity developed by other processes is lost, and the net effect is increased soil acidity.

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Pole Mwadzombo

As I settled for the interview, I noticed a caring agronomist, a wiseman of maturity and a leader with authority. His humility made him approachable and easy to relate with. This is Pole Mwadzombo.

How would you explain Mwadzombo Pole background and your job to a 10-year-old (Personal background and professional background to your current position as Agronomy Manager ornamentals and export vegetables at Amiran Kenya Ltd

I joined the profession in 2002, at Kingfisher farm Naivasha as a general worker where I had the privilege to work in all sections of production of Roses. Later I was promoted as a young irrigation technician, a job I worker for 6 months before I went to Uganda as an expatriate at Rosebud, in charge of crop nutrition and propagation.

Can you explain your education background and why you chose your major?

I happened to have been inspired by our Agriculture teacher at high school, a former graduate of Egerton University. I used to be his Best Agriculture student. This motivated me to pursue a degree in B.Sc. Horticulture and later a Master degree in Agriculture and rural Development.

How would you describe your time as the Agronomy Manager ornamentals and export vegetables? at Amiran Kenya Ltd? Are you passionate about what you do?

I balance my time between office and field work. This is my passion as it helps me to identify the gaps and needs in the industry and articulate them well to agrochemical producers.

Briefly discuss your role at Amiran and your day to day interaction with growers? What are your top priorities in your current position?

I joined Amiran Agro Division department 13 years back as an Agronomist in charge of North rift and later promoted to the position of the Agronomy Manager EA in charge of Ornamentals and export vegetables. The two slogans we have in Amiran, A complete solution for the best harvest and Our Knowledge your success makes us strive to source for reputable, authentic and reliable solutions to agriculture, an important sector of our economy. I am part of the team that is instrumental to bring solutions which are simple, appealing, flexible, available and cost effective at the same time empowering the grower with the right information.

In a nutshell describe Amiran Kenya ltd products portfolio for the flower sector and how you have ensured they are not only quality but also well used?

As a leading solution provider, our products are sourced from the reputable and respectable countries all over the world. We have strong ties with Multinationals such as Bayer, Syngenta/Adama, UPL. Nippon soda, Simutomo, Sineria Netherlands, etc. Going through our Amiran growers' manual, you will realize that we have solution for all the agronomic challenges in the flower sector.

We have long time partnership with the inventors and leading suppliers of Soluble and speciality fertilizers that not only meet Kenyan standard but also European standard that guarantee quality and better results.

What can you promise the flower sector in the next few months?

I promise them that we will revolutionize Thrips management in Ornamentals which is the biggest challenge in crop protection and there we are, we have a Novel product in the market called GLADIUS which is delivering impressive results while ACTISOIL from Bancella is attacking the soil pupal stages.

Describe your ordinary day? Do you still have enough personal time?

Not real but I intentionaly create personal time.

What are the 3 most pivotal moments in your career that you either learned from and/or that got you where you are?

Three virtues I learnt – Patience, humility, value people regardless of social class.

If you weren't an agronomist,

I am an associate ordained pastor, you can guess if it were not this full time job of agronomist what would I be.

Words of advice to a young scientist (Influential or inspiring person)-

A BSC degree is just the start of a long journey, be ready to start at any level God will position you, just like myself I started as a General worker. Position and attractive packages come with time as long as you are passionate and dedicated.

Where do you see the agrochemical sector globally in the next 5 and 10 years from now?

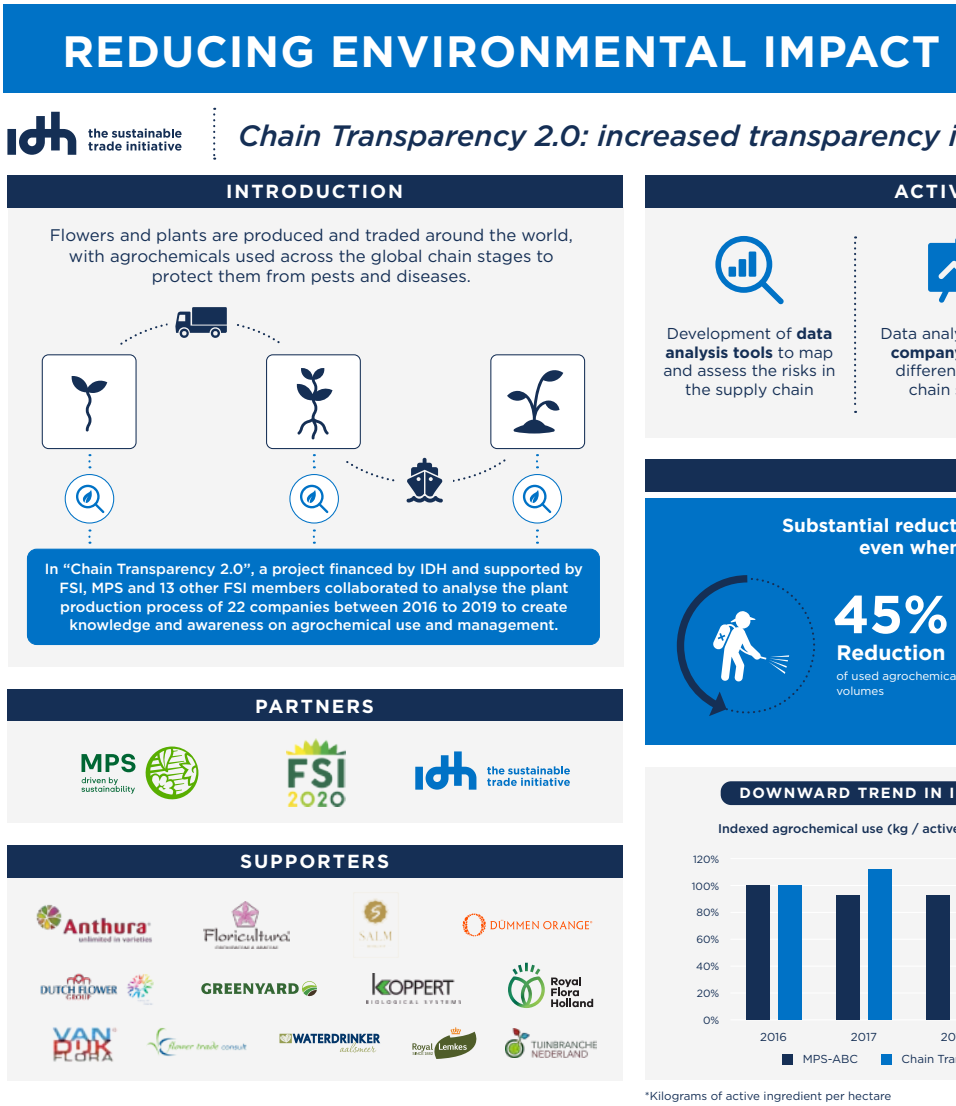
A lot of Mergers are coming up with focus to sustainable agriculture. Something many people don't know about me I love diversity of culture and tribes

How have you managed the stress of tight deadlines?

Proper planning and time management, know what is urgent and what can wait

Increased Transparency on Agrochemical Use For a Lower Environmental Impact of the Flower Industry

Improved transparency and management of agrochemical use in the flower and plants sector is inevitable. Sustainability standard MPS, together with 13 other members of the Floriculture Sustainability Initiative (FSI), collaborated on a project resulting in a substantial reduction in agrochemical use and a reduced environmental impact.



Please see the above factsheet for a more detailed overview of t

The need for more transparency in agrochemical use

Flowers and plants are produced and sold around the word and move through a global supply chain, starting from a cutting or young plant stage, to a stage in which it grows roots and finally to the grower stage, where it grows into the plant which eventually gets sold.

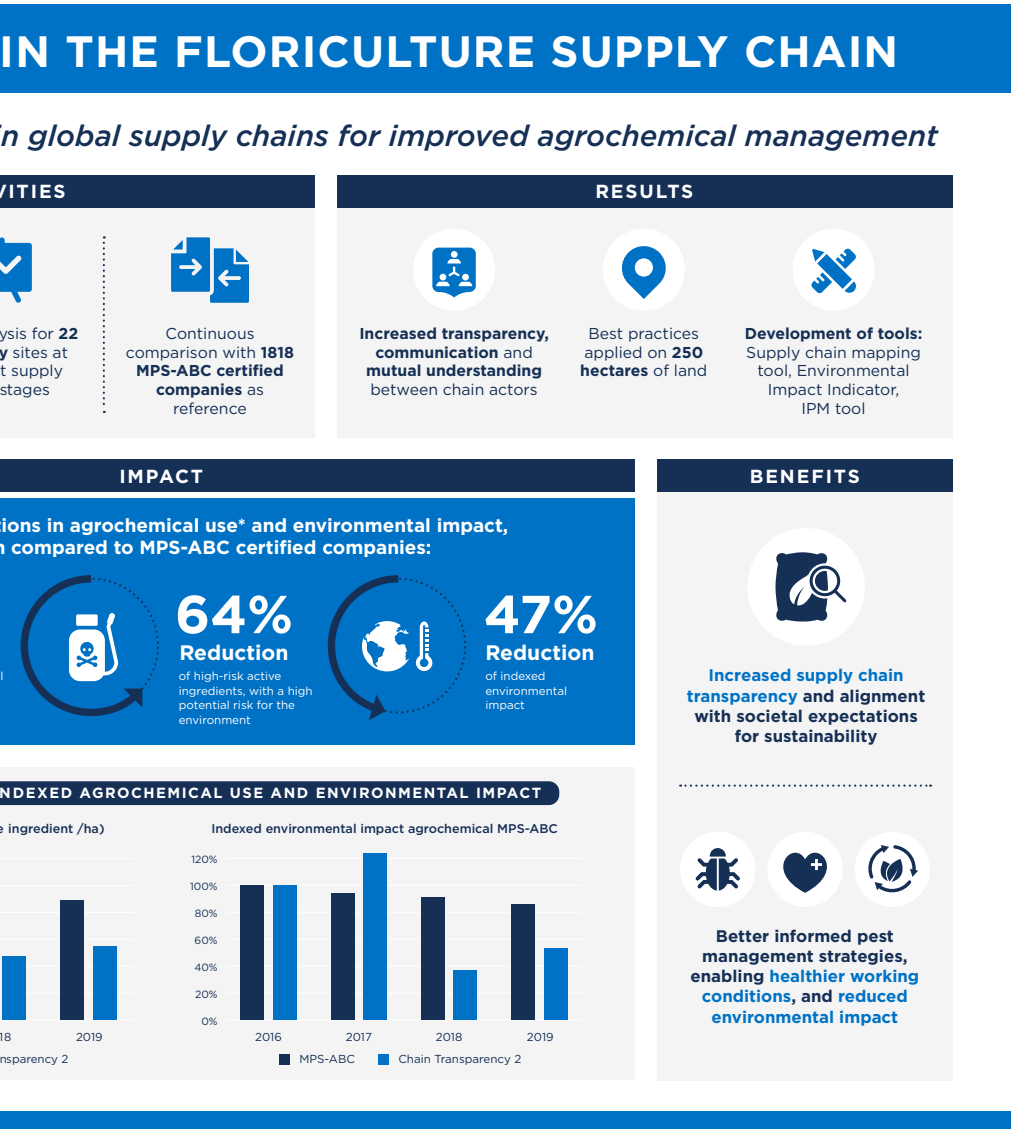
Agrochemicals are used throughout this global supply chain, and growers do not always know which product has been used earlier on in the chain. To increase transparency in agrochemical use throughout the chain and to reduce the use of agrochemical for a better and safer environment, sustainability standard MPS collaborated with 22 companies (out of which 8 are FSI member) in the project "Chain Transparency 2.0".

The Chain Transparency project, funded by IDH and facilitated by FSI, followed the plant production process of these 22 companies between 2016 and 2019, making information of agrochemical usage of the supply chain available by collectively taking samples of the products, recording and analyzing data, and identifying best practices for responsible agrochemical usage. By doing so, the project partners created more knowledge of agrochemical use as well as a collaborative commitment on practical solutions to improve. These outcomes have been echoed by participating companies during these interviews.

The Chain Transparency 2.0 project is a great example of how a combined floriculture supply chain approach leads to benefits for the whole sector. By following the plant production process of 22 companies, and testing best practices for responsible agrochemical usage, the project demonstrates how the Floriculture Sustainability Initiative members work collaboratively to meet sustainability challenges.

Reduced environmental impact

The activities under the project increased transparency and communication throughout the chain. Through these activities, participating companies gained improved insights in agrochemical use, allowing them to make better informed pest management decisions. As a result, the participating companies demonstrated substantial reduction in agrochemical use, with 45% reduction on average and even a 64% for the group of agrochemical active ingredients with a high potential risk for environment. The average reduction of agrochemical use volume translates to an environmental impact reduction of 47% per hectare on which the agrochemicals were used. This is substantial even compared to the combined records of 1,818 floriculture companies that are certified to the MPS-ABC environmental standard, which demonstrate a positive but nonetheless lower reduction of the environmental impact of 14% in the same period.



he results of the Chain Transparency 2.0 project.

The Chain Transparency Project leads to several long-term benefits, which range from increased transparency and alignment with societal expectations, to healthier working conditions and improved environmental impact. The insights from the project will be translated into responsible agrochemical strategies which can be used by the whole floriculture sector, and potentially other sectors, to reduce environmental impact.

Enhanced data management for improved environmental sustainability

The approach taken in the Chain Transparency 2.0 project builds on the flower sector's movement towards improved data management and transparency to enable more sustainability. Whereas in the past, data would capture how much of a agrochemicals' active ingredient was used per hectare without translating that into local impact on the environment, CPA data of flower companies under the Chain Transparency project is directly transformed into environmental impact classifications. This is done by including risk factors in the data analysis, allowing companies to consider environmental factors, substance properties and emission reduction measures.

This advancement in environmental impact assessments contributes to efforts of developing an environmental impact indicator and aligns well with the FSI approach and strategy. FSI has recently developed environmental benchmarking criteria for the FSI basket of standards. This new basket aligns sustainability standards to align on digital record keeping on use of agrochemicals, fertilizer, water and energy. FSI is furthermore in the closing stage of the development of their 2025 strategy which, amongst other things, will focus on data management and environmental footprinting to reduce the environmental impact of FSI members.

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	shivaniket@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@fontana.co.ke
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	Bipin Patel	0735873798	everflora@dmblgroup.com
Evergreen Crops		Nairobi	Arun Singh	0721941009	arun@evergreencrops.com
Exotic Peninah	Roses/ Carnations	Athiriver	Dan	0734626942	dan@exoticfields.com
Fairy Flowers	Flowers	Limuru	Sylivester	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@freshgolgkenya.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	Olkalau			production@highlandplants.co.ke
Imani Flowers	Summer Flowers	Nakuru	Raphael Otieno	0792302466	raphael@imaniflowers.co.ke
Interplant Roses	Roses	Naivasha	Gavin Mourittzen	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	Mirium	-	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@kenfloraa.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	japtag@vegpro-group.com
Kongoni River Farm - Kongoni	Flowers	Timau	Oppaso Bandgar	07120070053	oppasobandgar@vegpro-group.com
Kongoni River Farm -Bemack	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	Rajedra 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
Mahee Flowers	Roses	Olkalao	Natarajan	0738999149	natarajan@eaga.co.ke
Maridadi Flowers	Flowers	Naivasha	Jack Kneppers	0733333289	jack@maridadiflowers.com
Maua Agritech	Flowers	Isinya	-	-	-
Mau Flora	Roses	Molo	Mahesh	0787765684	mahesh@mauflora.co.ke
Milenium Growers	Summer Flowers	-	Sushant Wankara	0731316000	sushant@marvelgreens.com
Molo Greens	Solidago, carnations	-	Justus Metho	0722755396	justus@mologreens.com
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@niniltd.com
Nirp East Africa	Roses	Naivasha	Danielle Spinks	0702685581	danielles@nirpinternational.com
Ol 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@panocal.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

FLOWER & VEGETABLE FARMS IN KENYA

FARM NAME	PRODUCT	LOCATION	CONTACT PERSON	TELEPHONE	E-MAIL
PJ Flora	Roses	Isinya	Santos Kulkarni	0738990521	santosh@pjdave.com
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@primarosaflowers.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
Shalimar Flowers	Flowers	Naivasha	Dinkar Wandhekar	0702418174	dinkar@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	Pravin Yadhav	0735741774	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	Shantaram	0740212816	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@terrasolkenya.com
Timaflor Ltd	Flowers	Nanyuki	Simon van de Berg	0724443262	info@timaflor.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@uhuruflowers.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 Remeeus	0721868312	johan@roseskenya.com
Valentine Ltd		Kiambu/Limuru	Joseph Kariuki	0728 093 379	joseph.kariuki@valentinegrowers.com
Van Kleef Kenya Ltd	Roses		Judith Zuurbier		roses@vankleef.nl
Van Kleef Ltd	Roses	Njoro	Karan Mandanna	078500460	karan@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	-	-

New red coming to the Dutch clock this Valentine's

Kenyan farm Everflora introduced a new red from the breeder United Selections at the Dutch clock. The new red named Gladiator; has a deep red velvet colour, with full and impressive opening with no blackening when fully open. This variety comes with a stem length of between 50-80cm and a vase life of 12-14 days.

"The beautiful red rose is a result of breeding excellence, the culture and mindset of breeding with love and intent to add beautiful colours to the world of flowers." Optimal who is the unpacker of Everflora has been running several vase life, quality tests and doing intense preparation as they gear up towards Gladiator's introduction at the clock this week.

Ghanshyam Dusang farm's General Manager Everflora has urged customers to have Gladiator at the top of their minds. Being a new baby in the world of love, with a good head size and a significant amount of petals.

After the introduction and even post Valentine's, Gladiator will continuously be available at the clock.

New horticulture levy to fund fumigation facility

Funds from the recently established 0.25 percent horticulture export levy will be used to set up a fumigation and hot water plants for processing of mangoes as the country prepares to resume shipments to the US, Europe and other key markets.

Kenya has not been exporting to these key destinations in the last seven years due to presence of fruit flies that forced a number of countries raise the red flag.

"These funds will play an important role on research in the horticulture sector and also help in putting up of a common user fumigation facility to be used by all stakeholders," said Benjamin Tito, head of the directorate.

He pointed out that funding shortfall had limited Kenya's response to the quarantine pests leading to stricter requirements by the export markets.

Select Breeding organizes open house in Naivasha

Thursday February 25th and February 26th, rose breeder Select Breeding held their open house at Oserian two lakes flower park in Naivasha, Kenya. For the third time, they organized it together with Delbard and De Ruiter, who are both located at the end of south lake road.

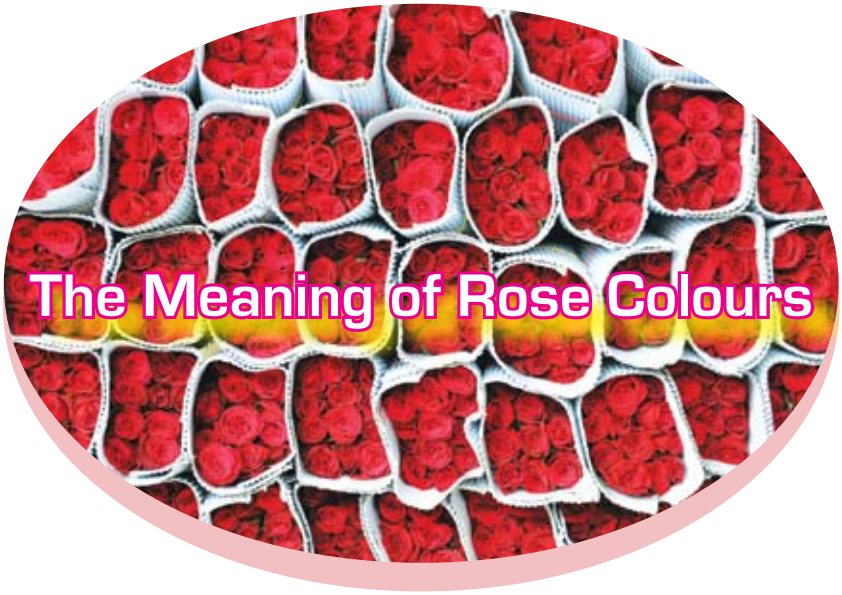
10 commercial varieties and one new red rose

During the open house, 10 commercial varieties that are being cultivated in Kenya and one new red rose introduced, named Red Bentley were displayed. "This new red rose belongs to the premium segment and stands out by its bright red color, excellent vase life and good transport characteristics," says Michael de Geus.

New codes and sprays

On top of the commercial varieties, also codes flowered for the first time. "We look forward to hearing and seeing the reactions of the growers. We attach great importance to this."

Also for the first time, Select Breeding planted spray roses.



The countdown to Valentine's Day is officially on! While red roses are the traditional flowers given on this holiday, there are so many different colors & varieties available, and the colors mean different things! (Hint: do not give yellow roses to a potential love interest... can you say Friend Zone?)

Please feel free to share the infographic below with your customers to encourage them to think outside of the box when it comes to ordering blooms for their honey's this year!

Roses are red…and white, pink and yellow too! Although the red rose is a traditional representation of love and admiration, there are many different colors that each express different emotions or relationships. Roses aren't just for lovers, they can also be for friends, co-workers, family members, or even to the grieving to express your affection or sympathy in a platonic way.

Red: Sincere, Love and Respect; Courage and Passion
Says: I Love You

Pink: Grace and Gentility, the rose of sweet thoughts. Conveys admiration and sympathy
Says: Thank You

Yellow: Friendship, joy, gladness and freedom. The promise of a new beginning.
Says: Have a Great Day or Congratulations

White: Spiritual love and purity. The rose of confessions. The bridal rose.
Says: You Are Heavenly or I Miss You

Lavender: Love at first sight and enchantment. Makes a special impression.
Says: Love at First Sight

Orange: Passionate desire, pure enthusiasm, and fascination.
Says: You want to pursue a new relationship further.

The number of Roses is also significant, from a simple I Love You to a Will You Marry Me.

1 Rose- Love at first sight.

2 Roses- Mutually in love with one another.

3 Roses- I love you.

5 Roses- I love you very much.

6 Roses- I want to be yours.

7 Roses- I'm infatuated with you.

9 Roses- An eternal love. Together as long as we live.

10 Roses– You are perfect.

11 Roses- You are my treasured one; the one I love the most.

12 Roses- Be my steady.

13 Roses- Secret Admirer

15 Roses- I am truly sorry, please forgive me.

20 Roses- Believe me, I am sincere towards you.

21 Roses- I am devoted to you.

24 Roses- Can't stop thinking about you, 24 hours in a day.

33 Roses- Saying I Love You with great affection.

36 Roses- I will remember our romantic moments

40 Roses– My love for you is genuine.

50 Roses- Regretless love

99 Roses- I will love you for as long as I live.

100 Roses- Harmoniously together in a century; remaining devoted as a couple until a ripe old age.

101 Roses– You are my one and only love.

108 Roses- Please marry me!

365 Roses- Can't stop thinking about you each and every day.

999 Roses- Everlasting and eternal love.

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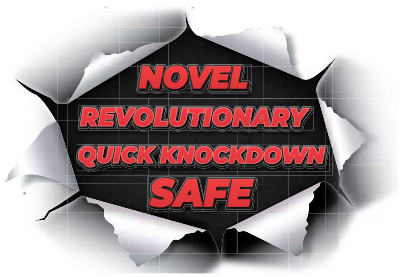

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