

ISSN 2075-5015

Hortfresh™

March - April 2018

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JOURNAL

FOR LEADS IN HORTICULTURE

VOL 11 EDITION 62



*Success story of herbs farming
at Lucky Farm*

*Siera Flora, on what it takes to produce
High Quality Premium Roses*

*A young farmer makes a fortune in
growing watermelons*



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Hortfresh Journal is bi-monthly published and circulated to members of relevant associations, government bodies, and other personnel in the horticultural industry as well as suppliers of equipments, materials and services.

Hortfresh™

JOURNAL
For Leaders in Horticulture



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Issue of: March - April 2018

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Publication Frequency

Bi-monthly



Hortfresh journal



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In my Opinion

Time to plant trees and harvest rain water

In our schooling years, we were taught that 'agriculture is the backbone of our country'. This phrase was literary over emphasized but with our young developing brains, the phrase had no meaning at that time.

At the moment, the phrase has gained tremendous meaning especially with drought period that has ravaged the country recently. It is not well in agriculture as a result of insufficient rains.

The importance of water in farming cannot be gainsaid. Climate change is real due to human activities such as

tree logging that has affected the country's water catchment towers. Many areas in the country recently were experiencing extremely high temperatures which they had not experienced before.

The Government should be applauded for initiating tree planting and banning logging. Tree planting will go an extra mile in conserving dwindling forest cover and increasing water catchment areas.

With the onset of rains, everybody especially farmers should seize the opportunity to harvest rain water and also embrace tree planting. This way the sustainability of agriculture will be assured.

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Published by



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Valentine

sales, a great start for flower Exporters



Valentine sales presented a great year start for flower exporters in the country. The season was great from preparations as the weather was favorable which saw an increase in volumes of flower exported.

Last year, the country earned 70 billion during valentine season. Kenya Flower Council had projected a 30 percent increase compared to 2017 season. Kenyan flowers continue to attract international market because of their longer vase-life.

During valentine season Ethiopia and Colombia experienced cold seasons thus affecting their production, which led to many buyers opting to purchase flowers from Kenya.

The growers in the country reported good sales on account of a stable Euro which is the medium payment in the European market. The euro was stronger and the volumes were there to match the orders. The currency appreciated from 110 Kenya shillings last year to 123 Kenya shillings in 2018. Though no available figures, it is evident that volumes were higher compared with what was harvested last year when the country was experiencing bad weather.

Demand for flowers rose both in the export and domestic markets. The season sales continued to UK women's Day. Air freight companies reported a doubling of flower exports and flights to Europe.

UK being one of Kenya's main markets for flowers, has experienced increase in the number of cities that the Kenyan flowers are transported to. As a result air freights are being trucked to the British cities of Newcastle, Manchester and Southampton, thus the increase in volume.

Locally Valentine's Day was accompanied by a financial windfall. Sales increased as compared to 2017. The City Market in central Nairobi was a beehive of activities on as florists used every trick in the book to lure customers. A single stem of red rose retailed at one dollar while a large bouquet of roses accompanied by a bottle of red wine retailed at 45 dollars. The trend have gone digital with orders being made through social media platforms.



IFTEX 2018, running simultaneously with Fresh Produce Africa (FPA)

The 7th edition of International Flower Trade Expo is coming on 6th to 8th June 2018. IFTEX has become one grand floriculture events in the world, presenting a platform for interaction among Kenyan flower growers and international flower buyers.

Buyers from Russia, Middle East, China, Dutch, European and Asian countries gather in this event every year to purchase the superb quality flowers, making the event famous.

Exhibitors and buyers from African countries such as Rwanda, Ethiopia, and Tanzania among others also attend the event. During the event competitions for the best breeders and best grower title is held.

The fair is characterized of astonishing, ambience, cozy atmosphere of professional, where high quality flowers of numerous flower designs are displayed.

This year fair will simultaneously



take place together with the first edition of the international trade exhibition for the fresh vegetables and fruits industry "Fresh Produce Africa" (FPA), which was rescheduled from April 17-19.

Ethiopia flower industry at a glance

The Ethiopian horticulture & floriculture industry has developed over the past 15 years into a full grown player, and putting itself in the world map as one of the leading exporters of cut flowers.

Eyeing the huge potential of the sector, the government of Ethiopia has availed 6000 ha of land for horticulture in Alage, Arbaminch, Awassa and Bahirdar.

Besides doing well, Ethiopia has faced a Myriad of challenges with civil unrest thus affecting flower production. There have been reported cases of shortage of workers. This could also have resulted to rescheduling of Ethiopia Horti flora expo, a HPP Exhibition to next year.

According to Ethiopian Investment Commission, the government is considering the idea of organizing the sector into cluster and gathering farms in parks. "It is not proper to let the industry with such high job creation potential and important role in the foreign trade to rely on dispersed farms:

It should be in cluster industrial parks". He said, adding that potential areas for horticulture clusters have been identified in various parts of the country.

"Five big clusters are prepared in the country in Bahir Dar, Hawassa, Arbaminch as well as North side of Ethiopia which have one stop services and zero liquid discharge filtering system," Deputy Commissioner of Ethiopian Investment Commission, Belachew Mekuria said. By doing this, the country hopes to concentrate horticulture farms in parks like the industries. This

would help companies to get access to one stop services.

It would also enable companies to easily access air transport to major market destinations, proved by the recent move by the Ethiopian Airlines to open direct freight services dedicated to flowers between Bahir Dar and to Liege, Belgium.

The pledge by the Airline to avail similar freighter services from other flower producing regional states such as Hawassa and others, display that products from these areas would be easily reaching the market.



Why the future of Irrigation is solar...



Farmers everywhere know the importance of getting water to their crops, especially in the dry season when prices soar. On a small farm, irrigating at the right time can increase income by over 35,000 Ksh per year. But the highest profits are only achievable with a cheap, or free way of delivering water to the field. Here's where a solar pump comes.

Farmers who have purchased a solar pump from Futurepump [link] know this first hand. The Futurepump SF2 can pump up to 3,600 L/hr using just the power from the sun. This is enough water to easily irrigate up to an acre of land using sprinklers or by moving the portable system around the farm. Also, unlike fuel pumps, maintenance is easy and cost-free as spare parts are easily obtained and covered by a 5-year warranty.

Irrigation itself is by no means a new idea. Being able to irrigate on demand ensures higher crop yields as growing conditions are optimised for the plant. However, if you have ever spent hours manually bringing water to the fields or have spent hundreds of shillings purchasing fuel or oil for a fuel pump, you know irrigation itself can be a burden. So just imagine being able to achieve this higher yield without the labour or fuel costs!

Vincent Onyango, Kisumu County, has used a solar pump for over a year now and says he would not go back to manual irrigation. His solar pump provides enough water to support his tree nursery business and vegetable crops with enough daylight hours left over to rent the pump to neighbours for a fee. Through the increase in income from his farm and the rental revenue he has been able to invest

in a greenhouse with drip irrigation – it has enhanced his business.

Overview of the Futurepump SF2 solar pump:

- Up-gradable start with 2 panels (80W) and upgrade to 3 (120W)
- Pumps up to 21,000 L/day (120W)
- Performance: 3,600 L/hr at 1 m, 2,500 at 6 m (120W)
- Can lift water 15 m
- USB phone charging socket

- Works well with storage tanks, drip systems and sprinklers
- Robust caged design
- Five years on-site parts and labour warranty

So, if you have a shallow water source and farm up to an acre of land this pump could transform your farm into a sustainable business. You can find out more by visiting www.futurepump.com



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Our wide range of vegetable seeds varieties are carefully selected in local screening and field demo trials across Africa and corresponding breeding locations by our seeds suppliers. We carefully source and select varieties that have unique characteristics such as tolerance to common pests and diseases, high germination vigour, short day maturity and higher yield with an aim of giving growers maximum profitability.

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- Eggplant
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- Okra
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- Spinach
- Collard
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- Beetroot

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At Continental Seeds Company Ltd, our focus is on providing the best value vegetable seeds to growers. To achieve this, the focus on the grower extends throughout the entire organisation, with a highly specialised technical sales team, marketing team, research and development department all dedicated to providing customers and growers with the best quality seeds that answer to their specific needs.



Trials for tomato and capsicum by research and development team



Farmer field training at Othaya



Farmer field day in Jinja, Uganda



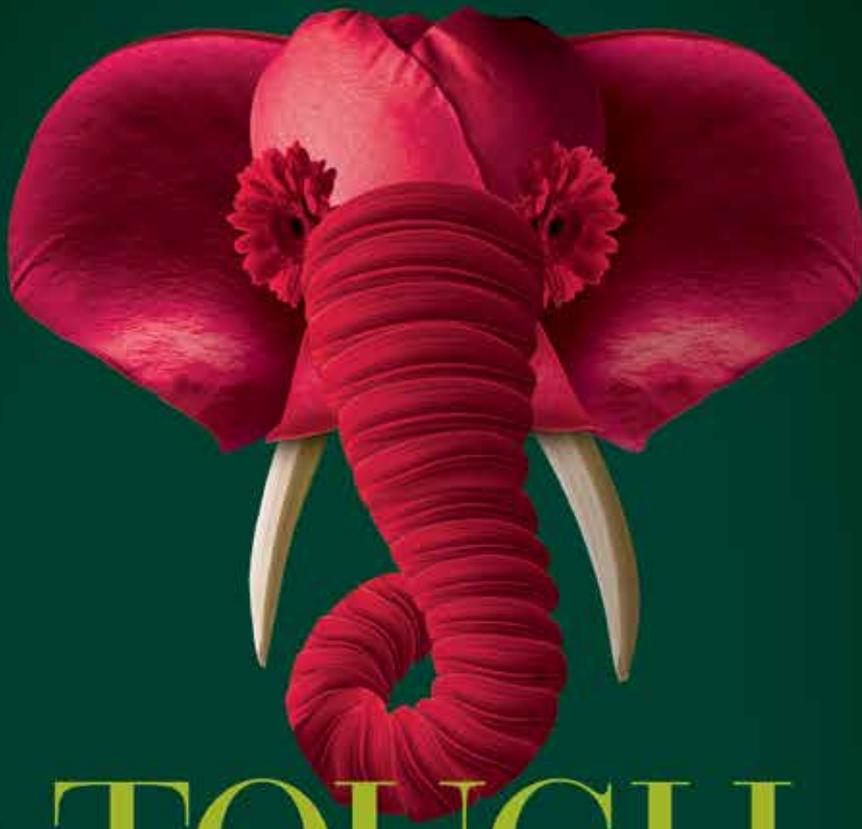
Farmer field day in Nkubu, Meru

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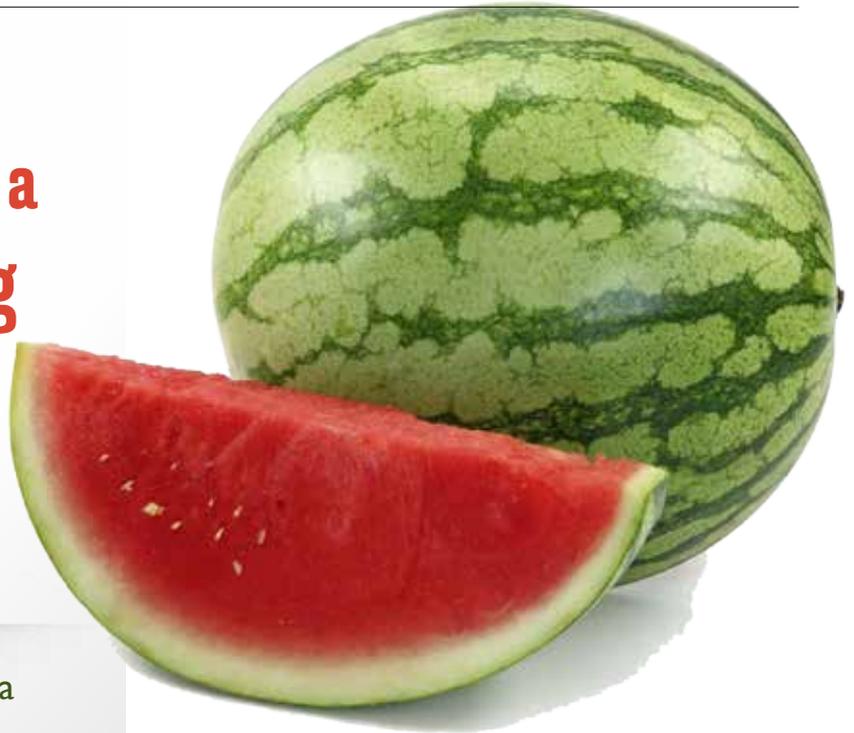


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A Young farmer makes a fortune in growing watermelons



The difficulty of finding a job in Kenya has seen some young people pursue opportunities in agribusiness instead of spending many years looking for employment. One such person is Derrick Mutugi. Unlike his peers in his age group who take up farming by chance, Mutugi has always had a passion for farming as it has been his family's mainstay.



Derrick Mutugi, a young melon farmer who has taken farming as his mainstay. He is farming at Gati- Iguru, Murang'a County.

During his tertiary training at Kenyatta University, he had to sometimes skip some lecture lessons to attend to the farm especially during days when planting, spraying and harvesting was being done.

He has found greener pastures in watermelon production, making a tidy sum from the juicy crop. He ventured into melon farming after learning about the high demand of the crop in Kenya and beyond.

Driven by his mantra of "building my own dreams while am still young least someone else will use me do build his" he has leased a three acre piece of land at Gati-Iguru Village, Gatanga constituency in Murang'a County. Armed with a seed capital from his savings he opted for Sukari F1 variety watermelon seeds, and

purchased other requisite farm inputs, prepared the seed bed and his mission took off. He asserts that seeds and pesticides are quite expensive as seeds to plant an acre cost him 11,500 shillings.

"The first step to producing watermelon is to choose the variety you want to grow and proper preparation of the seed beds. One has to meticulously follow the laid down procedures of planting the crop which is quite rigorous," he says. For his case, he had to contract an agronomist who advised him to first carry out a soil test on the farm before embarking on the actual planting. After the soil test, it was discovered it had an accumulated amounts of acidity which they neutralized with agricultural lime.

He gets manure for his crops from Maasai

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herders. His farm is majorly organic but avers that he top dresses with CAN to boost nutrient levels in the plants.

He narrates that for the crop to generate well, the crop should be well spaced. The seeds take between 7 to 10 days to germinate, depending on the soil temperature and the depth they are sowed.

Despite some challenges in his first harvest, Mutugi fetched a profitable amount from the crop he had planted on a half- an acre. This, he says, motivated him to invest more in the crop.

Determined to scale up production, he has bought irrigation pipes and a water pump, in addition to leasing more land in the area which he has diversified to

tomatoes and onions farming. "We draw water for irrigation from Thika river which passes near this place. The river has been very helpful to us during

dry spell we witnessed in this area and in the country at large," he said.

However, there are challenges the farmer is grappling with: fungal diseases multiply rapidly



on melon leaves, alternaria leaf spot, anthracnose, and gummy stem blight produce spots on leaves, while stem blight also forms bleached or tan sections on stems. Downy mildew causes yellow or pale green leaf spots, while powdery mildew produces white spots on leaves. He treats by spraying fungicides. "White flies, aphids, melon fly are

some of the pest that give me headache. I do routine spraying to control them and have erected traps to trap them and especially melon flies which can be a menace if not controlled early," he asserted.

He has employed a farm manager who does the daily operations and sources for services of other employees when work on the land demands additional

labor during weeding and planting. Finding trustworthy employees in the region is one of the undoing's he had to go through.

"I usually sell my produce at Makongeni Market, Thika town. Currently the price is low as a kilo is fetching between 18 to 20 shillings," he said.

His advice to young people; Follow your passion, be Prayerful, be

committed to your work and exercise patience as it takes some time to recoup investment back as it is business like any other. However, "If you are interested in farming and your parents have land at home, do something on the farm and it will earn you some cash as you wait for your dream job." he added that since people need to eat every day, farmers are unlikely to lack customers.

Health Benefit of Water Melon

Watermelons are delicious and refreshing and a healthy fruits. They have high water content and also deliver many other important nutrients. It is high in vitamin C, vitamin A and many healthy plant compounds.

● Helps hydrate the body

Eating foods that have high water content can also help. Watermelon is 92% water. High water content is one of the reasons that fruits and vegetables help you feel full. The combination of water and fiber means you're eating a good volume of food without a lot of calories.

● Contains Compounds that May Help Prevent Cancer

Researchers have studied

lycopene and other individual plant compounds in watermelon for their anti-cancer effects. Although lycopene intake is linked to a lower risk of some types of cancer, the results are mixed. The strongest link so far seems to be between lycopene and cancers of the digestive system. Lycopene appear to reduce cancer risk by lowering insulin-like growth factor (IGF), a protein involved in cell division. High IGF levels are linked to cancer (

● May Lower inflammation and oxidative Stress

Inflammation is a key driver of many chronic diseases. Watermelon may help lower inflammation and oxidative

damage, since its rich in the anti-inflammatory antioxidants lycopene and vitamin C. As an antioxidant, lycopene may also benefit brain health

● May help relieve muscle soreness

Citrulline, an amino acid in watermelon, may reduce muscle soreness. Interestingly, watermelon juice appears to enhance the bio-availability of citrulline. One small study gave athletes plain watermelon juice, watermelon juice mixed

with citrulline or a citrulline drink. Both watermelon drinks led to less muscle soreness and quicker heart rate recovery, compared to citrulline on its own.

● Is good for skin and hair

Vitamins A and C in watermelon are important for skin and hair health. Vitamin C helps the body make collagen, a protein that keeps your skin supple and your hair strong. Vitamin A is also important for healthy skin since it helps create and repair skin cells. Without enough vitamin A, the skin looks dry and flaky.



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The flower care program



Sierra Flora on what it takes to produce HIGH QUALITY PREMIUM ROSES

When the demand of high quality premium roses shot up, Roseto Group Directors decided to start a farm at high altitude; 2250m in 2011 and called it Sierra Flora. Roseto is their first farm located at rongai at an altitude of 1950m and the third farm is Florenza located at solai, at an altitude of 1700m.

Sierra Flora sits on a 26 hectares piece of land and is among the few flower farms in the country that have invested in a trial site. Before they grow any

variety acquired from breeders, it has to go through performance test for 1-2 years to test its productivity, good stem lengths and head size. At the moment there



Mr. Sharieff Kaleemulla, the General Manager of Sierra Flora, a farm producing high quality premium roses at Elburgon, Nakuru County.



Cable transportsystemusedatSierraFlorato transportflowers from greenhouses to their pack house.

are over 200 varieties of roses from different breeders worldwide which are being tested.

“The flower industry is like a fashion industry, market and buyers preference keep on changing from time to time. We have to cope up with the market demands and needs from time to time to enable us to be in business, said Sharieff Kaleemulla, the General Manager

Currently, the company is cultivating more than 15 varieties of premium quality roses, head size 5+ and above and stem lengths of between 50/60/70/80 centimeters which makes the flowers most preferred in the auction market. They have new varieties such as

Jolie, Mandala, Venus, Lemonetti dancing cloud and light pink sakazi.

To ensure the high quality premium roses are without damages, they have invested in a cable system which they have installed along their greenhouses. The cable which is more than 3 kilometers long ensures quick means of transport and avoid damages of flower heads, ensuring that flowers reach the pack house intake area in the shortest time possible.

“Clean and good supply of water is very important in flower production; we harvest all rain water from the rooftops of greenhouses and have several boreholes to supplement the same when the rains are not pounding.



DeRuiter

creating flower business



Rob Letcher -rob.letcher@deruiter.com
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Fred Okinda- fred.okinda@deruiter.com

Quality flowers, needs clean water for faster growth," he pointed out

They strictly adhere to procedures related to production as well as post harvest. They have a centralized post harvest system. All the flowers are harvested with proper care and are sized according to length in the greenhouse, wrapped with harvesting nets and transported in clean baskets with clean post harvest solution. Each harvesting net contains 20-30 flowers depending upon sensitivity to damages. The procedure helps them in reducing

head damages and broken stems.

"We have a centralized spray system and a fully automated fertigation system. This makes certain that all the required chemicals and nutrients are mixed at their respective places and pumped/sprayed to the greenhouses at the required ratio. We have also incorporated mulching in our farming for all our newly planted area and it helps to suppress weeds, maintain moisture and also control fungal diseases like

downy mildew and thrips infestation.

Achieving high quality roses demands good growing practices such as good and timely cultural practices, hygiene monitoring day to day fertigation requirements, timely control of pest and disease and finally harvesting right cut

stages of flowers without damages as per the market requirements.

The farm values education, they believe it starts and ends with reading quality books. They purchase books and other learning stationeries and keep on donating them to schools located near the farm.



A view of Sierra Flora trial greenhouse, where different roses are tested before they are planted at the farm.

Harmonic Systems

Providing Effective Solar Water Solutions for Medium and Large Scale Farms



Mark Muinde Founder and Director, Harmonic systems Africa. The Company provides effective solar water solutions for all

Until recently, solar water pumps have been limited to low volume use and because medium to large scale farms require high volumes of water (50m³-600m³ per hour), solar pumps were simply not able to meet their demand. But times have changed.

Solar power, or energy created by the sun, can be harnessed in a number of ways, including through solar panels that convert the sun's rays into electricity. In the case of a solar pump, solar energy is converted into electricity and fed to a pump that circulates water. These types of units can be used in to supply water from a river to a dam, a borehole to a dam and even from a dam to a farm.

Harmonic's Solar Pumping Inverter (SPI) brings all the benefits of solar to larger pumps. This unique solution takes advantage of variable speed drive features and integrates power from either the solar panels or simultaneously from the solar panels and grid/generator supply (Hybrid mode). It is also capable of running most submersible and above the surface water pumps.

The SPI solution is versatile enough to manage pump systems with constant pressure, distribution of water from one location to another or even multiple pumps working together.

The SPI solution has a very high return given the typical kinds of reduction in energy costs, which can range from 60%-100% in power reduction. This means tremendous savings overtime for any business.

Furthermore, the SPI solution does not require the original plumbing to be changed. The only modification needed is electrical wiring, avoiding additional costs of replacing the existing pump.

Harmonic Systems is an Engineering company mainly focusing on renewable energy in the East Africa region. It was founded in 2009, under the



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water pumping
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- Simultaneous Solar and Grid/Gen use
- Submersible or Surface Pumps
- Low Maintenance
- 5kW-500kW Motor Rating
- Savings of up to 50 - 90%
- Variable Speed Drive integrated
- No need to replace water pump or motor
- Scalable, multiple pumps
- Rapid installation
- Short payback
- PV module warranty - 25 years
- Solar Pump Inverter warranty - 3 years

leadership of Director Mark Muinde. The company has tremendous experience having undertaken major projects in various parts of East Africa including Kenya's remote areas, Tanzania, South Sudan, Uganda, Djibouti and Somaliland. They primarily focus on four key areas:

1. Grid-tie solar
2. Off-grid solar with storage
3. Solar water pumping
4. Monitoring

The SPI system works in two ways: Solar Only Mode or Hybrid Mode and in case you are not aware of the difference between the two, they are explained below.

STAND ALONE MODE – SOLAR ONLY

The SPI is only connected to the solar field, generating the necessary power to start and speed-up the pump. The minimum power required depends on the hydraulic response of the complete pump-load system. The SPI controller automatically starts the pump when there is sufficient irradiation and it will also speed up the motor throughout the course of the day. The flow rate varies with the amount of irradiation and this mode uses no external power from the grid or from an external generator.

With the MPPT dynamic search algorithm developed by Harmonic Systems, the SPI searches for the Maximum Power Point automatically. The solar field will always deliver the maximum power available, irrespective of whether the system is working in various conditions, or of the intensity of sunlight.



Hybrid Mode - Grid/Gen and Solar

In hybrid mode, Solar Pumping Inverter is connected simultaneously to the AC mains and the solar field. During broad daylight, the energy generated by the PV panel is injected into the motor. This helps to proportionally reduce the power consumption from the grid. When a cloud partially covers the panels, the drive will absorb more grid power to keep the process constant if this is the required outcome.

Harmonic Systems has developed a system that is able to use all solar energy available and take from the AC supply only the complementary power. This system connects/disconnects the AC input to the mains therefore avoiding the need to have a "stand by" power source. The SPI takes all energy possible from the PV field to pump the water needed, and if the energy of PV

field is not enough, SPI switches on the AC input to "top up" and deliver all energy required by the motor. Once the energy available in the PV field is higher than the energy needed by the motor, the system will disconnect the AC input. This can use both AC from the grid or as in remote areas, an external generator.

Harmonic Systems has a strong commitment to reduce the levelized cost of water (LCoW) by powering water pumps with technology, combining solar and traditional forms of energy. This means that returns can be realized very rapidly from a CAPEX point of view.

Harmonic Systems also has options for financing through some of their well-established partners.

To save on water pumping costs, visit www.harmonicafrica.com or email info@harmonicafrica.com

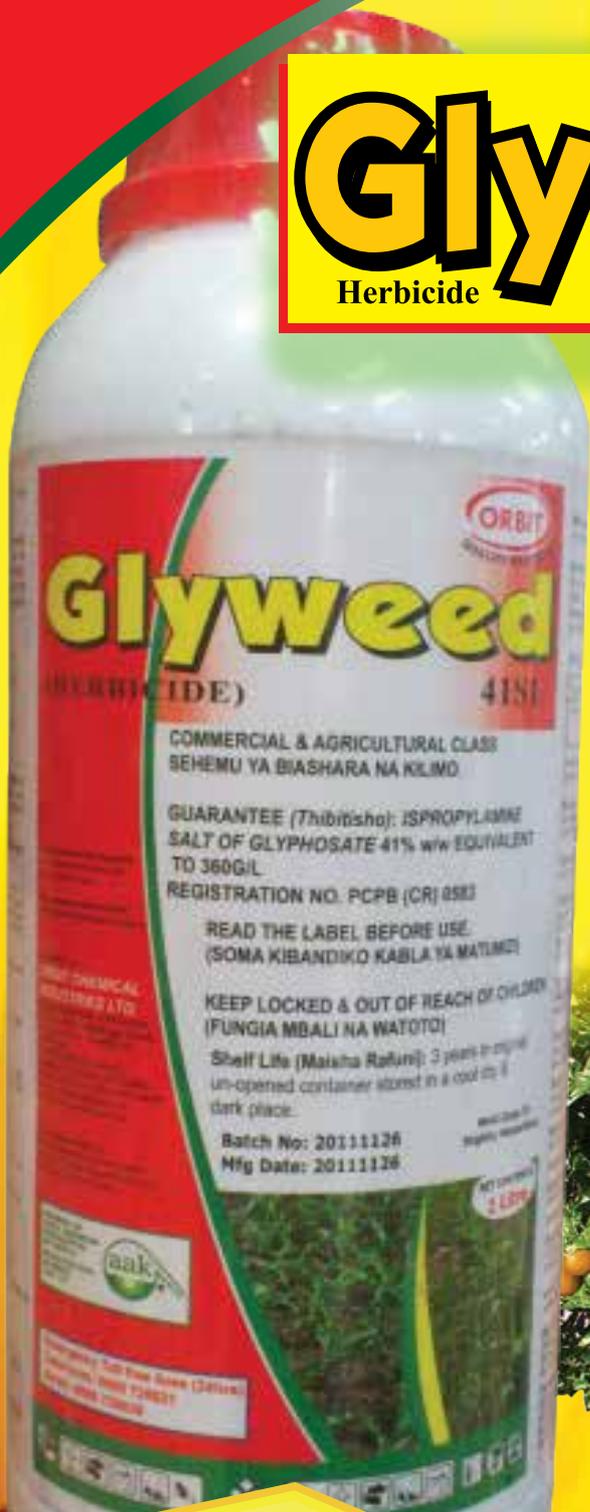
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Pesticide First Aid Procedures



The best safety expression any workplace can have, which uses pesticides and highly values worker health and safety, is that of "Prevention is better than Cure."

However even with the best of efforts and procedures; accidents happen and therefore appropriate planning, training and first aid procedures are crucial for successful outcomes in the event of poisoning through contact with pesticides.

A good starting point and workplace initiative is to foster a sound knowledge of the signs and symptoms of chemical poisoning.

First Aid Procedure for Acute Pesticide Poisoning

If you are trained in first aid you will be able to assess the situation and may be able to do the following:

- See if the victim is breathing, if not, administer artificial respiration (CPR), ensuring you are not contaminated.
- Decontaminate the victim immediately by washing thoroughly. Speed is essential.
- Call the ambulance or the closest hospital.

However, if you are not trained in first aid the best course of action would be to follow the label/SDS first aid instructions and contact the emergency services as soon as possible.

If the chemical has been spilled on the skin or clothing:

- Remove the clothing immediately if it is contaminated and thoroughly wash the skin with soap and water. Avoid harsh scrubbing as this enhances chemical absorption.
- Rinse the affected area with water, wash again and rinse.
- Gently dry the affected area and wrap in a loose cloth or a blanket if necessary

If there are chemical burns of the skin:

- If there are chemical burns of the skin, cover the area loosely with a clean, soft cloth.
- Avoid the use of ointments, greases, powders and other medications unless instructed by a medical authority.

If the chemical has been inhaled:

- Get the victim to fresh air immediately; carry the victim (don't let the victim walk)
- Have the victim lie down and loosen clothing
- Keep the victim warm and quiet
- If the victim is convulsing, watch the breathing and protect the victim's head
- If breathing stops or is irregular, give artificial respiration.

Do not attempt to rescue someone who is in a closed, contaminated area unless you are wearing appropriate protective equipment.

If the chemical has entered the eye:

- Hold the eyelid open and immediately begin gently washing the eye with cool to warm clean running water
- Do not use chemicals or drugs in the wash water unless instructed by a doctor
- Continue washing for 15-20 minutes
- Avoid contamination of the other eye if only one eye is involved
- Flush under the eyelids with water to remove debris
- Cover the eye with a clean piece of cloth and seek medical attention immediately.

If the chemical has been accidentally injected:

Treat the puncture wound to control any bleeding and prevent infection. Seek medical advice as some animal health vaccines such as Gudair contain mineral oils which can cause severe irritation, pain and swelling for many months.

If the chemical has been swallowed:

- DO NOT INDUCE VOMITING
- Always Read the Label/SDS
- Get the victim to a doctor or hospital as soon as possible and take the SDS with you.



Alstroemeria: sparkling colours and enduring friendship

A special flower that's available in many sparkling colours.

When you see the freshly cut flower, the Alstroemeria hides its beauty in the bud. But when it opens it surprises you with many sparkling colours. The six to eight flowers on the stem become visible, often in some form of tiger print, combining sparkling colours of white, yellow, red, orange, purple or pink. Another characteristic is the stem with beautiful twisted leaves.

Symbolic

A great reason to use this flower in bouquets is its symbolic meaning of enduring friendship. All six of the Alstroemeria petals are very important. They stand for understanding,

humour, patience, empathy, commitment and respect. Your customers can decide for themselves which petal represents which quality. All the more reason that these should be enjoyed as long as possible in the vase!

Post-harvest treatment

The right treatment to keep your Alstroemeria's beautiful after harvesting is Chrysal BVB (0,15 ml/l). It prevents the yellowing of the leaf and ensures that the buds open fully. When you combine the treatment of Chrysal BVB with Chrysal AVB (0,5 ml/l), the Alstroemeria is also protected from ethylene. It prevents the dropping of buds and premature aging of the flowers.



Chrysal AVB prevents dropping of buds and premature aging.

Chrysal BVB ensures buds open fully and prevents leaf yellowing.

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CHRYSA



Workers busy harvesting Basil herbs in one of the greenhouses at lucky Farm .

Success story of herbs farming at Lucky Farm

A rich aroma engulf our nostrils as we step our feet in Lucky Farm. The sweet scent is emanating from various herbs that Maggie Muya is cultivating on her five acre farm at Kinanie; Machakos County, near Athi River. A Look at the farm are beautifully constructed greenhouses under basil cultivation and in the open fields are neat lush thriving mint, rosemary, thyme, majoran among others. It's unbelievable to anyone visiting the area that in the middle of these semi-arid lands, there exist farming investments of this magnitude.

She drew her desire for farming from a friend; they had unutilized land thus she decided to venture into pig farming in 2010 before shifting to onion and tomato farming. The unpredictability of the market forced her to shift to herbs after incurring massive losses due to 'flooding' of the commodities in the market place.

"I could lose close to one and half tones of tomatoes; I thought of value addition but I felt burnt out; I needed to do something new, fresh, thus why I dived into herbs. I say dived in because I had no prior knowledge on herbs cultivation

and the few farmers who were cultivating were not willing to share information. I learnt the hard way; making mistakes and learning from them. This was quite different compared to onions and tomatoes where information was all over; I could attend seminars organized by Kenya Agricultural & Livestock Research Organization (KARLO) to get information and also online," Maggie alluded.

She contracted an agronomist who has been very instrumental in her success. She also teamed up to share information with 2 other herb farmers whom they have grown

together in this noble venture.

Though herb cultivation is a lucrative venture, it is capital intensive and high risk field which has no shortcuts. One has to invest on greenhouse structures, a cold storage, enough clean water and a pack house. Herbs degenerate very quickly thus timelines have to be adhered to and should be transported with cold refrigerated trucks where a constant temperature of 4°C is maintained throughout the supply chain, until they are delivered to the client.



"To export, a farmer has to be GlobalGAP and KEPHIS certified which is costly and stringent. On top of the main certifications, there are other certifications such as BRC and Sedex; depending on the importing country and supermarkets requirements. Maintaining these high standards and rigorous audits such as in packaging, proper recording of spray program, scouting program, pest management is not easy," she opined.

Records of the crop sprayed, the targeted disease or pest, which block, pre-harvest interval, the active ingredients and many others have to be maintained. Kenya Plant Health Inspectorate (KEPHIS) are very strict on pests, diseases and maximum residue levels (MRL). "If a consignment reaches the airport and pests are discovered it's returned immediately; if this happen thrice you are stopped and

they come to audit the farm. Worse is when it leaves the airport and it's detected on arrival abroad; it attracts a penalty of 2.5 Euros per ton, you also pay for the freight charges and KEPHIS shuts down your ECS account hence you can't export,"

To curb pests and diseases, movements at Lucky farm greenhouses is restricted. Workers are restricted from accessing other greenhouses other than the one they are working in. This goes in hand to ensure if a greenhouse has been detected of pests, they are not carried to other greenhouses. The greenhouses are completely sealed and double doors constructed with side netting to prevent entry of pests. At the moment she avers that leaf miners and spider mites are the biggest threat to herb farming in the country.

"Before I began exporting I was selling

my produce to local exporters. Acquiring skilled workers was a challenge. Most people in this locality were not competent to handle herbs, this forced me to source for workers from as far as Kitengela where they were working hence they could only work on their off days or late hours," she said.

She intriguingly reveals that her first produce was 100 kilo but with lack of trained workers it took her 3 days to ensure the produce was well harvested and packed. Although she had the capacity to produce 800 kilograms of herbs, exporters could only take 100Kgs. Currently she is exporting 1.5 tones per week.

Basil being her major crop takes 3-4 weeks from planting to be ready for harvesting. When harvesting basil those of good quality are harvested and taken to the pack house

weighed packed and taken to the cold room.

Herbs are mostly planted as seedlings which retail for Kenya Shillings 2.5 to 5 by propagators plus transportation cost.

Herbs being heavy feeders in nature require lots of water and a farmer need a good source of water to sustain them. Maggie has drilled a borehole. Continuous use of borehole water leads to high sodium levels in the soil. She treats the soils by adding humus and compost manure which she composts on her farm.

Maggie asserts that farming is a very fulfilling field and she is delighted to have created employment opportunities to the locals whom she has trained.



New CEO; Clement Tulezi

Clement Tulezi is the new CEO of the Kenya Flower Council. He has taken over from Jane Ngige who served the Council for 12 years. Tulezi has a 23-year track record of driving marketing and communications at local and international levels.

He has a solid understanding of linkages and information flows within agricultural market systems & value chains, cross functional team management and policy advocacy.

Clement has previously worked in the media, democratic governance and water, energy and shelter sectors. Additionally, he has supported peace building and conflict resolution in a number of countries across

African continent. He will drive the Kenya Flower Council agenda into a period ahead where the floriculture sector faces new challenges and opportunities. As the Chief Executive, Clement has overall responsibility of the secretariat.

Rwanda becoming a major investment destination

Rwanda has made remarkable progress in its economy, which is primarily driven by agriculture. The country is placed 56 (out of 183 countries) in the Ease of doing business index of the World Bank and 2nd in Sub-Saharan Africa.

The country has a favorable tax regime for foreign investors such as; lower taxation on profits and

duty-free imports of raw materials and machinery.

It has a temperate climate with year round temperatures ranging from 16° - 25°C. It experiences two long rainy seasons (Sep – Dec and Feb – May).

The Rwandan Government launched an Agriculture Land Information System (ALIS) in 2016 (www.minagri.gov.rw/investorapp). With this

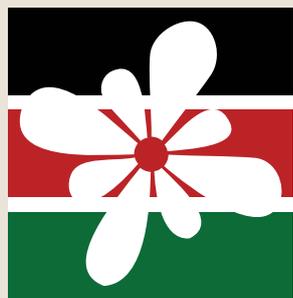
online system, investors as well as commercial agricultural businesses can identify land available for investment purposes and who to contact.

Rwanda horticulture sector has recorded remarkable growth in recent years and contributed US\$21 million export revenue in 2017. The UK is supporting the sector through the US\$29.1 million “Improving Market Systems for Agriculture in Rwanda” program, which is expected to expand horticultural trade in local, regional and overseas market. The Dutch government is funding

US\$20.1 million which is expected to reach 44,000 farmer households in six districts, especially in North West Rwanda.

Rwanda has enjoyed and maintained political stability since 1994. This is necessary for investors to put up their monies without fear of unrest which could crumble down their investments.

In Rwanda labour is available at competitive costs (USD 1.5 –2/day for unskilled labour and approximately USD 300-400 for experienced agronomists). The country has natural resources to exploit and a small uncompetitive industrial sector.



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From Embu with love for fruit seedlings propagation

Cyrus Kariuki and Paul Njiru; two brothers who are very industrious in fruits seedling propagation at their farm in Kamiu, Embu County

In the tranquility of Kamiu village in Embu County is a fruit seedlings nursery that leaves one admiring the industriousness of Kenyans. On a 5 acre farm, there are over 500,000 fruit seedlings of various species at different stages of growth, all well-tended to by a workforce of more than 20 people. This is a business of two brothers Cyrus Kariuki and Paul Njiru.

The nursery was began in early 80's by their father as an agro-forestry, they later changed it to fruits propagation centre after realizing an upsurge demand of fruits.

According to Kariuki and Njiru, Kenya's climate conditions are favorable for fruit farming with various regions experiencing diverse weather conditions which makes it unique to various fruit cultivation. "We have Mangoes, Avocados, Macadamia, Oranges, Tederine, Lime, Grapes Pawpaws, South Africa Apples, Quavers and many more," Cyrus Njiru the Production Manager of the farm says.

With the onset of the long rains, Paul Njiru's phone who dubs up as the Marketing Executive of the farm keeps interrupting our conversation as he

responds to calls from various clientele making inquiries and placing orders for the various seedlings. "We receive orders from all over East African region. We have successfully delivered seedlings to the war torn Somalia, Uganda, Tanzania, Ethiopia and Rwanda among others," Paul Njiru says.

The brothers aver that setting up a fruit nursery unit is easy. One requires a good supply of clean water, target different markets and acquire certification by KEPHIS and HCD which is critical. "This two Government bodies are essential as they give advice and rectify where mistakes are noted. KEPHIS usually visits us after every six months to inspect if there are pests and diseases and recommend effective

chemicals to use. They also help in terms of marketing as they usually refer clients to us. They referred World Vision NGO as well as Embu, Laikipia and Nyandarua county Governments, who bought good number of Hass avocados. The Embu Catholic church has also been supportive as it buys seedlings and distributes to locals in the region," Kariuki happily said.

They have witnessed an increase in demand for macadamia, avocados and mangoes. For avocados they are propagating; Hass and Fuerte, Mangoes; Apple, Tommy, Kent and Ngowe while macadamia they have Murang'a 20, Kirinyaga 15 and Embu 1.

The propagation process begins with collecting seeds which they attribute to being suitable for



Workers tending to young propagated seedlings.

rootstocks. The seeds are potted with soil in black polythene papers and left to germinate. Twenty one days after germination, they are checked to ensure they have reached a pencil thickness which is the recommended size for propagation.

They source for scions from different orchards including KARLO, Embu. Scions of high quality genes and good dormancy are selected. "The cuts we

make should be absolutely clean, boat shaped, even and smooth. The ends of these cuts should be round and not angular. The cut surfaces of both stock and scion we make them to coincide facing each other so that there remains no hollow space between them. We tie a polythene strip of about 1.5 cm in width around the union. Later after 21 days, they are untied and are ready for planting," Kariuki explained.

"Macadamias have to be put in a greenhouse under net tunnels after propagation for a period of 35 days. They need special treatment and their temperatures have to be regulated before we take them to the open fields for hardening," he continued.

The farm sells all seedlings for 100 shillings each with the exception of macadamia which goes for 150 shillings. According to them their prices are reasonable since the products are of high quality compared with those of other farms doing the same business. They usually deliver seedlings to farmers who request in far-flung areas by use of courier services.

"Our farm offers trainings on nursery management.

Recently, we hosted a group of students from Embu University College whom we trained and urged them to look at agriculture as a source of income and not a dirty work. It is possible to make money in rural areas. We have been able to educate our children in boarding schools and create employment" Paul Njiru said.

Driven by their motto 'farmers success is our pride', they are encouraging farmers to plant many fruit seedlings which will in future be used as food and agro-forestry too. This they say will be a milestone in assisting the Government initiative of planting trees and increasing forest cover.



Cyrus Kariuki and Paul Njiru in one of their shade net where they are propagating Macadamia

Kibera man grabs a flower exporting opportunity to eke a living



The GM Talib Ibrahim lending a hand to the export team and confirming a client's order at the coldroom

When Talib from Makina, Kibera travelled to Egypt to pursue further studies in nautical technology at the Maritime Academy, he had no prior knowledge of what was to befall him, which later became a game changer in his life.

At the university, an opportunity for exporting flowers from Kenya to Egypt came forth and he grabbed it and made best of it. For now, he looks back with satisfaction at the strides he has made in uplifting his economic status and those of his

Nubian community at Kibera slums through the venture.

"I developed a good relationship with the local Egyptians who soon wanted to find out how to buy flowers directly from Kenya," says Mr. Talib.

He became the contact person since he was a Kenyan and his ability to converse in Arabic was icing on the cake. Knowing that this was a golden opportunity that would probably never come back, Talib went to the internet to research on how the business works.

By the time the client was contacting him, he was armed with contacts and price offers from various flower farms willing to do business with him. "Within 10 days I had four



Export Executive Hamza Abey scanning a client's order for export documentation

price offers. I entered into a deal with an Egyptian client but my first attempt at the business was very disappointing," he recalls.

He exported 17 boxes each containing 5,400 stems of medium-head

roses instead of premium roses to the displeasure of the client. But the customer took the blame as he had not specified his requirements and duly paid for the order. And that is how his flower exporting company Abdulmuttalib



Stand exhibition during IFTEX in 2016



At the Airport finalising the manifest



Holdings was born.

It is located at Kibera's area, which is regarded as the slum's central business district. He opines that 'Makina' in the Nubian language means 'getting together' after dealing with the Egyptian client Talib learnt the finer details of flower exporting. He has since developed close ties with Magana Flower farm which delivers most of his orders.

Most of his clients are in Arabian countries and they get his contacts from an online portal he has been operating since he opened business.

Arab clients prefer premium roses and that is what he strives to export to them in various colors and assortment. "Currently I am working with recurrent clients; I know every week I must have 4,000 stems of roses on standby," he averred.

There is always a possibility that the client might want more," he says. On getting an order from the client, Mr. Talib drafts a proforma invoice guiding the customer on payment and then does a purchase order to the flower farms.

As is the rule in the trade, the consignment should be made up of a mixture of rose petal colors. With 30 per cent of it being red. The other 30 per cent should be white and the remaining 40 per cent made up of all the other color mix distributed evenly.

Business is fast picking up and he plans to expand to other ventures, including trade in beauty products and fabrics. While the business is still at its infancy stage, Talib who is



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the chief executive officer, says it can fetch a pre-tax profit of Sh120, 000 in a good month.

The high seasons for the business are in February owing to Valentine's Day that is celebrated globally. In the Arabian market, March draws some good returns as the locals celebrate Mother's Day. The days after Hajj and Ramadhan also offer some good returns.

Talib has four employees

but hopes to employ more people as the business expands. He says if an investor comes forward with as little as \$50, 000 his first step would be to establish a cold room in Kibera where the flowers can be preserved. He would then use the rest of the money to employ more staff to run his business, he says.

"My aim is to improve the economic status of my community who have been marginalized for too long

and denied opportunities to develop," says Mr. Talib. Currently his company has focused in growing of Gerbera and contracted farmers to grow outdoor summer flowers.

He urges young people to think first before declaring there are no employment opportunities. He says he has seen people who started small making it big thanks to their patience and hard work.

Sentinel agrochemical water treatment plant

We are WMEC, a UK based family company that 23 years ago developed and started to manufacture the Sentinel agrochemical water treatment plant - an Environment Agency, Voluntary Initiative, EU and World Bank approved system for the treatment and disposal of dilute pesticide waste.

The Sentinel treats the dilute pesticide waste generated from the agrochemical/agricultural sector - primarily from the wash down/tank cleaning/testing/filling/chemical store areas used during sprayer operation and maintenance. In brief the Sentinel plant collects the waste from the drain sump of the wash down area pad and cleans the water so that contamination is reduced by over 99.9% - to levels where the wastewater can be safely returned to the environment or reused.

WMEC have Sentinel agrochemical water treatment plants operating in over 56 countries at seed producers, flower growers, packers, arable farms, fruit farms, vineyards and research stations. Our customers worldwide include Syngenta, BASF, Frontier Ag, Selecta, Kenya Cuttings, Bayer, Scotts, RAGT, Harper Adams, John Innes and Monsanto to name a few, as well as farm conglomerates. In the UK we also design and manufacture very

niche effluent water treatment systems for all types of industries.

The demand for water treatment systems in the floriculture industry has increased over the last three years, particularly in areas of Kenya and Uganda where we have many plants treating water from large growing operations. They essentially discovered that they were contaminating their own irrigation water source with pesticide and organic/in-organic metals from their spraying operations to the detriment to their crops. Responsible growers took action and sought out a technology to stop the cycle of pollution for the benefit of the environment and the crops that they produce. Before this time we already had plants in the area with a very large TNC whose environmental policy states the use of the Sentinel as the only acceptable method of agrochemical water treatment - a few growers had seen our plants in action and sought us out.

Water is becoming a very precious resource and one that is now recognised as needing protection and conserving more now than ever with a change in many laws being actively enforced regarding the discharge of contaminants into the environment. In industries that spray crops, any waste from washing out or unused products



can be safely treated in the Sentinel and the treated water can be recycled or returned to the environment safely. This obviously stops pollution from occurring, can potentially save initial water purchase costs as its recycled, and can save on disposing of the contaminated water through a contractor.

The Sentinel is often chosen as it is a proven piece of technology, with independent lab trials and regulations naming it as the preferred disposal method. As it treats at the source, the contamination is dealt with immediately, rather than a system that delays treatment or is ineffectual. It is a very versatile plant that can treat herbicides as well as pesticides, and can easily remove heavy metals from water. Treating in batches from 250 - 2,000 litres there is a Sentinel sized for any site.

It benefits many crop spraying industries - the bulk of our business is with arable farmers, then flower/cuttings/plant growers and in viticulture. Payback is variable but many customers who were initially paying for disposal cover the cost of the plant within one growing season. For others the payback is

immediate as they could be facing hefty fines and facing legal action. For others it is purely a desire to do the right thing and to be environmentally responsible - indeed one customer has treated 3,000,000 litres of contaminated water through a standard Sentinel that cost £40,000 in three years and returns all of it to the local environment.

We are hopeful in the future that water treatment will become the norm rather than a requirement. We owe so much to the environment, it provides us with food and resources. With the ever greater demands we place upon the land we need to protect it, and we are nothing without water. Clean water is becoming a scarce resource in some countries and we are finding large growth in areas where drought is a concern as to be able to recycle water and prevent pollution is invaluable.





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The Influence of Plant Nutrition on Pests and Diseases



Botrytis in Basil Caused by High Nitrogen

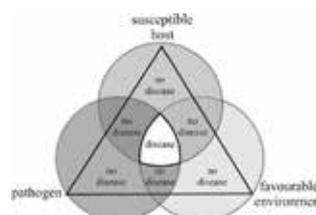


There is increasing pressure on us to grow healthy flowers, fruit and vegetables with less and less chemical pesticides. The export markets we supply to check pesticide residues in the produce and high levels can limit market access. With the new Horticultural Standards in Kenya being gazetted – there is also more pressure from the local markets on residues.

Before the First World War pest and disease control was achieved through a combination of proper crop husbandry, crop rotation and sulphur and copper. During the First World War a great deal of research was done on chemicals for chemical warfare. An off shoot of this research was production of chemicals that were effective for pest and disease control in crops. There was a major agricultural revolution. Pest & diseases were controlled, and food production became more secure and yields increased. It was only years later that we became aware of the side effects of these chemicals on human health. Not all chemicals are bad, and without proper pest and disease control we would be unable to feed the world. However, it important

to grow responsibly and minimize pesticide use where we can.

Before the First World War a great deal of research was done on plant nutrition and pest and disease control, and this work is now being re-visited and expanded on.



The Plant Disease triangle – for a disease to happen it needs a pathogen, a susceptible host and a favourable environment. Disrupting any of these will reduce the problem.

IT ALL STARTS WITH THE SOIL!

Many diseases start due to problems with rooting, soil structure, no oxygen, lack of drainage and waterlogging. A deep, well drained soil with a good crumb formation is your first line of defense against plant diseases. Next the moisture levels and temperatures play an important role in 'activating' pathogens. Generally higher moisture levels and temperatures encourage diseases and reduce the egg to egg time of insects' life cycles. Sadly, in East Africa we do not have the luxury of cold winters – that can kill off many diseases and insects.





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Next the soil pH has a great deal to do with how fast a disease progresses. Acidic soils tend to suppress quite a few diseases – however they also suppress nutrient availability and crop yield – so approach with care. The soil, water and drip pH determine the availability of nutrients to plants and can create excesses and deficiencies that can encourage insect and disease growth. It is better to keep the pH at the optimum for the plants requirement to grow a healthy disease resistant crop.

Proper plant nutrition is your next line of defense. Any nutrient that is deficient or in excess will increase a plants susceptibility to diseases and pests. Nutrients that's are known to influence pests and diseases in plants are: - the nitrogen form, potassium, calcium, Sulphur, chlorine, nickel, manganese and silicon.

Calcium is a primary disease controlling nutrient. The amount of calcium in the soil determines many things! 1) The pH, 2) The structure 3) The aeration. Check calcium levels

and ensure you have at least enough and at best luxury levels. Calcium in the plant is used to make calcium pectate – this determines how strong the cell walls are, and how resistant they are to insect and disease attack. Many diseases in many crops can be prevented by having enough calcium in the plant tissue. Low calcium in the soil results in compacted waterlogged soil, with poor nutrient uptake efficiency and weak stressed plants.

Calcium is known to suppress club root in cabbage, fusarium wilt in tomatoes, erwinia soft rot in potatoes and botrytis blight in many fruits and vegetables. Adequate calcium is essential for good shelf life of produce. Calcium is taken up via the transpiration stream and can become deficient in cool, overcast or humid weather conditions.

Potassium plays a major role in insect and disease suppression. Potassium deficient plants are very susceptible to both diseases and the weather! In many areas we are lucky to have enough or excess potassium in the soils.



However, it can become easily fixed into certain soil types, e.g. illites and clays. Unlike most plant nutrients – potassium does not become a part of any plant constituent and remains present in the plant sap. It is very mobile in plants and quickly moves from the older to younger leaves and to identify a deficiency you need to do a leaf analysis on both and compare. Excess potassium can also suppress or encourage diseases depending on the total nutrient status of the plant. In general potassium will suppress most diseases but can encourage Erwinia rots, downy mildew and nematodes. The N:K ratio is also critical for some diseases and insects. A high N:K ratio can encourage diseases.

A high K:N ratio tends to reduce disease severity and in conjunction with adequate phosphorous can reduce reproduction in aphids.

Excess nitrogen tends to produce weak, fast growing plants that are very susceptible to insects and disease damage. Most damping off disease occur due to excess nitrogen, high nitrogen encourages botrytis in plants that would normally be resistant to it. The form the nitrogen is supplied to plants can also have a major effect on disease resistance. Nitrogen can be absorbed by plants as the reduced NH_4 form or the oxidized NO_3 form. NH_4 reduces pH while NO_3 increases pH. Diseases react differently to the N-form. Nitrate

suppresses Fusarium wilts and Rhizoctonia root rots while ammonium suppresses most other soil borne diseases.

Chlorine is not generally considered a plant nutrient and can be toxic to many plants. However, research has found that in chloride resistant plants, chlorine can suppress plant diseases e.g. fusarium crown rot in asparagus, Rhizoctonia crown rot in beets, Fusarium Yellows in celery, and smut and stalk rot in corn. In most cases an increase in chloride resulted in an increase in manganese in the leaf tissue.

Plant testing and research has shown a good correlation between the concentration of manganese in healthy plant tissue vs diseased plant tissue. Fungal and to a large extent, bacterial diseases are reduced in the presence of adequate manganese uptake, while viral diseases may be enhanced by enhanced plant uptake. Manganese tends to be abundant in the soil, the limiting factor being the efficiency of uptake. Practices that improve manganese uptake tend to reduce diseases. Mulching, optimum pH, organic matter, soil temperatures and microbial activity in the soil. Glyphosate can reduce manganese uptake and encourage take all. Potato scab is mitigated by lowering



Fast Whitefly Breeding in leaves with a high nitrogen to potassium ratio

soil pH, irrigating or foliar feeding manganese. Some fungicides e.g. Mancozeb are much more effective in the manganese form.

Nickel is required in very small amounts and is generally sufficient in most horticultural soils. It is considered an ultra-micronutrient and not much attention has been paid to it. It is thought that nickel is important for nitrogen cycling in plant tissue and for eliciting the plants immune response by helping with phytoalexin production. Nickel salts are effective fungicide sprays against rust. Nickel uptake can be reduced in cold dry soils and in the presence of excess zinc, copper, manganese, iron, cobalt, magnesium and calcium. More work needs to be done on nickel.

Sulphur is very important in disease control – it is required to induce the plants natural resistance to fungi through triggering natural

metabolic processes. This is now termed SIR – sulphur induced resistance. Sulphur also has a topical toxic effect on funguses and mites – hence the use of sulphur burners in some greenhouses.

Silicon is the second most abundant mineral in soil. Adequate levels of silicon in the plants impart a healthy resistance to most diseases, and the source and rate of applied silicon can strongly affect the control of many fungal diseases in many plant species. Effective / affordable / and practical solutions are required for application of silicon to crops that can accumulate it, as it has been recognized that the use of silicon in pest and disease control would be a viable method of reducing fungicide use in many areas of agriculture. More research must be done on this.

Silicon in various forms has proved to be an

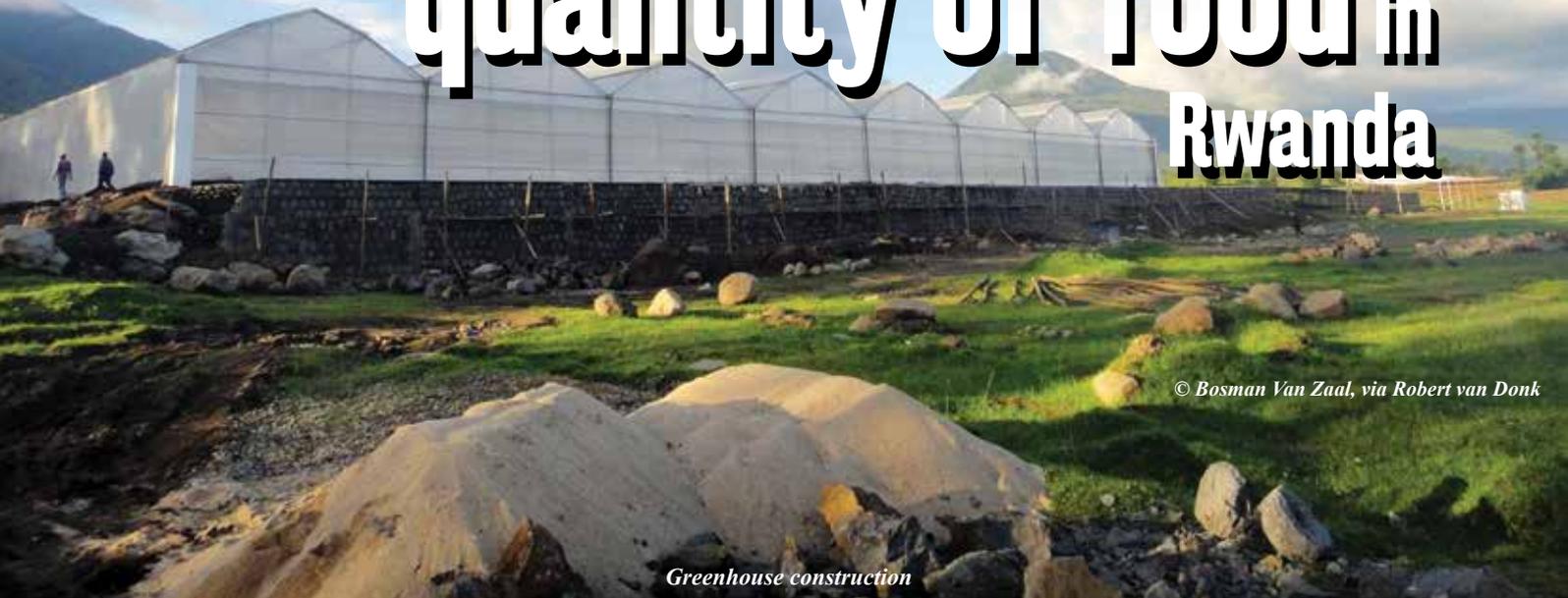
effective method of insect control. High levels of accumulated silicon in stalks and leaves can discourage chewing insects, silicon can dissolve chitin, causing dehydration in insects, and silicon can block insects spiracles – preventing oxygen from getting into their bodies.

High levels of EC (salinity) or sodium (sodicity) can greatly affect plant nutrient uptake and healthy plant growth and encourage diseases, nematodes and insects.

As you can see – the nutrient status of the plant plays a huge roll in determining its tolerance to insect and diseases, and much can be done with optimizing plant nutrition to reduce pesticide use. For more information on this, and to test the nutrient status of your plants please contact us on support@croppnuts.com.

By: Ruth Vaughan,
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Increasing quality & quantity of food in Rwanda



© Bosman Van Zaal, via Robert van Donk

Greenhouse construction

Horizon SOPYRWA: Bosman Van Zaal, Hoogendoorn & Holland GreenTech

By 2016, Rwanda coped with a serious potato seeds scarcity problem due to poor yields and a demographic growth. Farmers were using potato seeds coming from different sources or even old seeds left over from previous seasons which would not give enough yields. By the end of 2016, Horizon SOPYRWA, Rwanda's leading producer of refined, environmentally friendly pyrethrum products and essential oils, stepped in to make the difference.

Together to produce qualitative potato seeds

Potatoes are sensitive for a variety of diseases and thus high qualitative seeds are necessary

to meet the high demand for qualitative food. To realise this, Bosman Van Zaal, Hoogendoorn Growth Management and Holland GreenTech joined forces in September 2016 to develop a high technology greenhouse complex for Horizon SOPYRWA's potato seedlings/cuttings in the Musanze region.

Greenhouse complex with versatile constructions and installations: Bosman Van Zaal

To produce high standard potato seeds, Bosman Van Zaal designed a special greenhouse structure, including all required irrigation,

automation and electrical installations. The construction is located at a height of 2.200 metres where there is an average temperature of 17,8 degrees combined with very high rainfall. Because the potato seedlings are now grown in a fully controlled environment they can

be supplied throughout the year with a high and consistent quality level.

The approximately ½ hectare large greenhouse consists of a high quality steel and aluminium structure, covered with a special UV stabilised polyethylene film. To ensure the optimal climate inside, the



© SOPYRWA, via The New Times

Potato plants



Water pump



Irrigating Potato



iSii computer

High technology software system: Hoogendoorn

Hoogendoorn delivered the user-friendly iSii compact climate and irrigation computer that efficiently controls the climate and irrigation inside of the greenhouse complex. This enables Horizon SOPYRWA to save water and fertilisers by tuning the water dosage to the plant's need. At the same time, the climate control increases their yields and reduces pest and diseases by optimising the growing conditions.

greenhouse is equipped with automatic double sided roof ventilation windows, side gable ventilation screens, horizontal shading screens and special vertical circulation fans.

Rain water, harvested by the greenhouse roof is stored in a water silo from where it is used for irrigation purposes. Irrigation and fertigation is provided to the plants through the overhead sprinkler system specifically designed for raising young plants and seedlings.





© SOPYRWA, via The New Times

Potato plants

Realisation and ambition of the high technology greenhouse

All these inventive technologies were finally realised by Holland GreenTech when the construction was completed in March, 2017 and the first production started in April, 2017. The greenhouse acted as a pilot program that has been regarded as a success. This is why Horizon SOPYRWA aims to build similar greenhouses over the next five years and expand their distribution to the provinces.

The greenhouse has a capacity of producing 1.200.000 of seedlings/cuttings per quarter. The projection for 2022 is to produce 200.000 plantlets, 4.000.000 cuttings and 1.600.000 mini-tubers in total.

Farmers participate in workshops and training

To preserve the quality and further improve the production of high standard potatoes, Holland GreenTech offers guidance in the form of workshops and trainings for potato farmers that work with Horizon SOPYRWA.

From vision to solution: make your ambitions come true!

We welcome all clients with an ambition to produce their highest possible crop yield. Does that sound interesting to you? Then get in touch!



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