Volume 2 • 2018

the FORUM

HYGROTECH
SUSTAINABLE SOLUTIONS

INSIDE: Zaad Holdings | Biological Products | Baby Marrows | Forage Cereals
Water-melons | Perlka results | Sweet Peppers | Tomato Gourmet Extreme


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HYGROTECH
SUSTAINABLE SOLUTIONS

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ZAAD HOLDINGS
ACQUIRES HYGROTECH

ZAAD HOLDINGS Ltd is proud to have added HYGROTECH to our already extensive portfolio within the agricultural sector.

ZAAD invests in the specialised agri-inputs industry where we currently own, develop, import and distribute a broad range of agronomy, forage and vegetable seed, as well as speciality agro-chemicals into Africa, Europe and other emerging international markets.

ZAAD's major shareholder is Zeder Investments Ltd, a JSE listed company. Other companies in the Zeder stable include Pioneer Foods, KaapAgri, Capespan, Agrivision Africa and Quantum Foods. This makes **ZAAD** one of the only majority locally-owned multinational seed companies operating in South Africa.

Through our strategic investment across the agri-input value chain, we strive towards providing a total agricultural input product solution to our customers. Our broad range of vegetable, agronomy, forage and pasture seed is sourced through our strong international partnerships, or through various internal research and development programmes.

Our subsidiaries' extensive distribution networks have allowed us to be present in more than 90 countries around the globe. Our portfolio, product and geographical mix have been structured to mitigate agri-cyclicity. The specialised agri-inputs market, particularly the proprietary hybrid seed segment, remains attractive and we are well positioned to benefit from the growth that it offers.

Additional investments into the seed value chain include the local production and processing through a network of facilities in Southern Africa and Europe.

ZAAD owns a share in the following companies :

• Agricol	100 %
• Klein Karoo Seed Marketing	100 %
• Hygrotech	100 %
• Seedcor	100 %
• Nuvance	100 %
• Bakker Brothers BV (Netherlands)	100%
• African Seed Group	100%
• ZAR Seed Production Pty Ltd	100%
• Scicorp Laboratories	75%
• FarmAg International	49%
• DLF Seeds (South Africa)	49%

We also own a non-controlling share in Turkish company MAY Seed (35 %) whose expertise in especially sunflower seed is mutually beneficial to our own breeding programmes in South Africa.

OUR TEAM

The **ZAAD** head office is based in Brackenfell, Cape Town and has a small, but dedicated team who manages the group's strategic direction under the leadership of the CEO Antonie Jacobs.

The **ZAAD** group is excited about the future opportunities in the specialised agri-inputs arena. We are convinced that we are poised to take advantage of the many opportunities expected to arise in the segments and markets where we have a stake in.

Through our subsidiary, Klein Karoo Seed Marketing, we also have majority shareholding and control over a number of businesses in Southern Africa.

They include:

- Klein Karoo Seed Zimbabwe - 95%
- Klein Karoo Seed Zambia - 90 %
- Klein Karoo Seed Mozambique - 90%
- Agriseeds - 80%

WHY BIOLOGICAL PRODUCTS SHOULD BE INCLUDED IN INTEGRATED PROGRAMMES.

Compiled by Liana Erasmus, Manager: Special Projects, Hygrotech

Biological products are still a relatively new field in Agriculture, and a mostly unknown field comes with various questions. This article will enrich our producers in helping them understand this often-misunderstood field. The focus of this article will explain the difficulties encountered in the field of integrated programmes and more importantly help find solutions to unanswered questions.

The use of biological remedies in an integrated programme with agricultural chemicals and other biological products.

Biological products are live organisms and should be treated with caution when it comes to compatibility with other agricultural chemicals. The real challenge is the correct application of the product needed and the practical implications thereof.

Compatibility with fungicides:

Should a producer wish to protect his seed from pathogens for common soil diseases including Fusarium, Rhizoctonia, Pythium and Phytophthora, a good biological control agent would be a *Trichoderma*. *Trichoderma harzianum* is a fungus that is also used as a fungicide. The use of *Trichoderma* in combination with Thiram results in improved performance [(1)]. This specific combination offers a producer the effectiveness of a strong chemical which is the first line of defense, and then a prolonged effect of the natural *Trichoderma* that offers protection after the active ingredient in the chemical has been broken down. The producer can be sure that he has both a plan A & B in place to protect his seedlings and therefore ultimately, the potential yield. However, *Trichoderma* is commonly incompatible with various fungicides including the following active ingredients: Benomyl &Triflumizole. Should a producer have any doubt regarding the compatibility of a product with a biological remedy, it is advised to check with the suppliers of both the products.

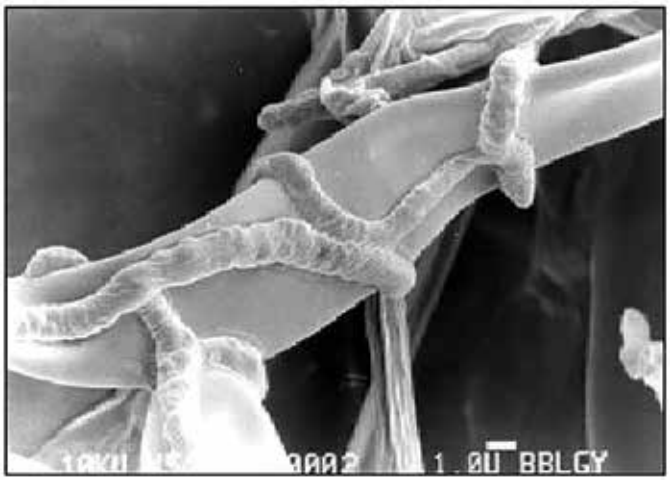

Figure 1: *Trichoderma harzianum engulfing R.Solani in SEM micrographs.*

Source: Itamar Soares de Melo1; Jane L. Faull2, Parasitism of Rhizoctonia solani by strains of* Trichoderma *spp. C.P. 69 - CEP: 13820-000 - Jaguariúna, SP. 2Birkbeck College, University of London, Malet Street, London, WC1E 7HX, UK.*

Compatibility with fertilizers:

Legume inoculants can be used as a good example to illustrate the effect of the incorporation of biological products with fertilizers: For example, the common practice of using Mono-Ammonium Phosphate (MAP) is acceptable, if the fertilizer does not come into direct contact with the inoculated seed. Soil salinities above the threshold values acceptable to most legume species may severely affect the survival and N-fixing abilities of *Rhizobium* species. Chloride salts of Na, K and Mg commonly used in fertilizers appear to have specific ion effects on *Rhizobium* growth and are more toxic than the SO4 salts. Magnesium inhibits *Rhizobium* growth at lower concentrations than Na and K[(2)]. It is important to follow good soil and agricultural practices to nurture soil organisms. The use of *Rhizobium* is of great value to a producer, with its ability to fix Nitrogen from the air and metabolize it. Application of a fertilizer like Limestone Ammonium Nitrate (LAN) instead of making use of the *Rhizobium*, can mean added costs Soybeans that have been effectively inoculated have the potential to fixate 85 -150 kg of Nitrogen per hectare per year, the equivalent of using between 300-530 kg of LAN per hectare. Using an inoculant with an appropriate fertilizer programme, is more cost-efficient.

Compatibility with other biological remedies:

It is a very common practice to use inoculants like the *Rhizobium* in combination with either *Bacillus subtillis* (Bacteria) or *Trichoderma*(Fungus).

Producers preferring a *Bacillus,* which is spore forming bacteria, instead of a *Trichoderma* as a seed treatment, would be correct to do so. It is however not advised that *Bacillus subtillis* be used simultaneously with *Trichoderma*, as the *Bacillus* will destroy the *Trichoderma*. Benefits of taking an integrated approach by using the *Rhizobium* with either *Bacillus* or *Trichoderma* include:

1. **Nutrient solubilizing:**
   A common problem encountered in the field is the fixation of Phosphates that engross a considerable percentage of the production costs. *Bacillus subtillis* isolates have proven to solubilize Phosphates that are fixed by the production of organic acids. This leads to the effective uptake of Phosphates needed by a plant and therefore has a direct influence on the feasibility of the crop and ultimately the return on investment. This means the producer earns more as yields increase, due to the efficient use of the nutrients supplied.

2. **Pathogen protection that is sustainable and affordable:**
   As mentioned previously, *Trichoderma* offers a prolonged defense mechanism against pathogens

threatening the roots of the crop. When the crop has a fully developed and healthy root system, it can absorb and use nutrients essential for optimum growth.

The use of Rhizobium inoculants in the presence of heavy metals such as; Molybdenum (Mo), Aluminum (Al) and Manganese (Mn).

The influence of acidic soils and heavy metals on legumes in general:

The common bean (*P. vulgaris L.)* is a major vegetable legume grown and consumed in Southern Africa. *P. vulgaris L.* yields in Southern Africa are reported to be very low [3]. The poor yields are partly due to infertility caused by acidic soils which have low nutrient contents, which could include Molybdenum [5]. Research efforts at improving bean yields in Africa have increased over the past few decades [5,6,7,8]. Soil acidity may affect all stages of growth and specifically the legume- *Rhizobium* symbiosis, from strain survival in soil and on the seed, to root-hair infection, nodule initiation and nitrogen fixation [8]. Higher concentrations and contents of Hydrogen ions, Aluminum and Manganese in acidic soils are known to be the major causes of poor growth in plants. This is due to their toxic effects on plants as well as microorganisms, such as Nitrogen fixing bacteria [9]. Keep in mind that the uptake of Molybdenum that is needed for amino acid production within the plant, is not good in acidic soils. This is a common problem many South African producers face. Ways of overcoming this problem will include:

1. **The use Molybdenum in combination with Rhizobium:**
   As an essential component of Nitrate reductase and Nitrogenase, which are enzymes that aid in the chemical reactions within the nodules to convert Nitrogen to Ammonia, Molybdenum (Mo) plays a central role in Nitrogen metabolism *(Figure 2)*. Studies have found Molybdenum fertilizer can significantly increase the Nitrogenase enhancing symbiotic Nitrogen fixation capacity of root nodules and the Nitrogen metabolism of plants. However, an overabundance of Molybdenum would change the permeability of bacteroid cell membranes and prevent the normal transportation of Ammonia. This could inhibit Nitrogenase activity, resulting in reduced Nitrogen fixation in root nodules. It has been suggested that the responses of different strains of *Rhizobia* to Molybdenum fertilization are dissimilar and depend on various factors, especially Molybdenum concentration in the seed-coating formulation. Thus, adding an appropriate amount of Molybdenum with the correct application method and at the correct concentration can improve seed respiration and increase the survival of the *Rhizobia*l cells. This offers an alternative way to provide the plan treat with Molybdenum, if faced with the problem of acidic soils.

2. **Examples of Molybdenum applications and their effects of various formulations and concentrations on Rhizobium:**
   There are many references to Molybdenum coating of legume seed, either as 1.) seed dressings with 0.002-5% Molybdenum or 2.) presoaking in 0.007-1.25% Molybdenum solutions or 3). as a foliar spray. Increases in yields generally occurred only with the lower range of rates used, higher rates often being depressive. Rates of 0.6% and 1.2% Mo as Sodium molybdate depressed rhizobia on subterranean legumes[10], but 0.02% Mo did not depress *Rhizobia spp.*[11]. Insoluble Molybdenum oxides are less depressive on *Rhizobium spp.* than Sodium or Ammonium molybdate. Rates up to 2.5% Molybdenum oxides are being used on sub-tropical pasture legumes without *Rhizobium spp.* depression.

At the China Agricultural University, Beijing, a hydroponic pre-experiment was conducted to screen for the best host-rhizobia symbiosis using alfalfa variety Zhongmu No. 1. Five fast-growing *Rhizobium meliloti* strains A, B, C, D and E were obtained from the Agricultural Culture Collection of China (ACCC). The meliloti strains are often used for Lucerne and medics. The strains E and D displayed different tolerances to Molybdenum addition and D performed better than E at greater Molybdenum concentrations. D was

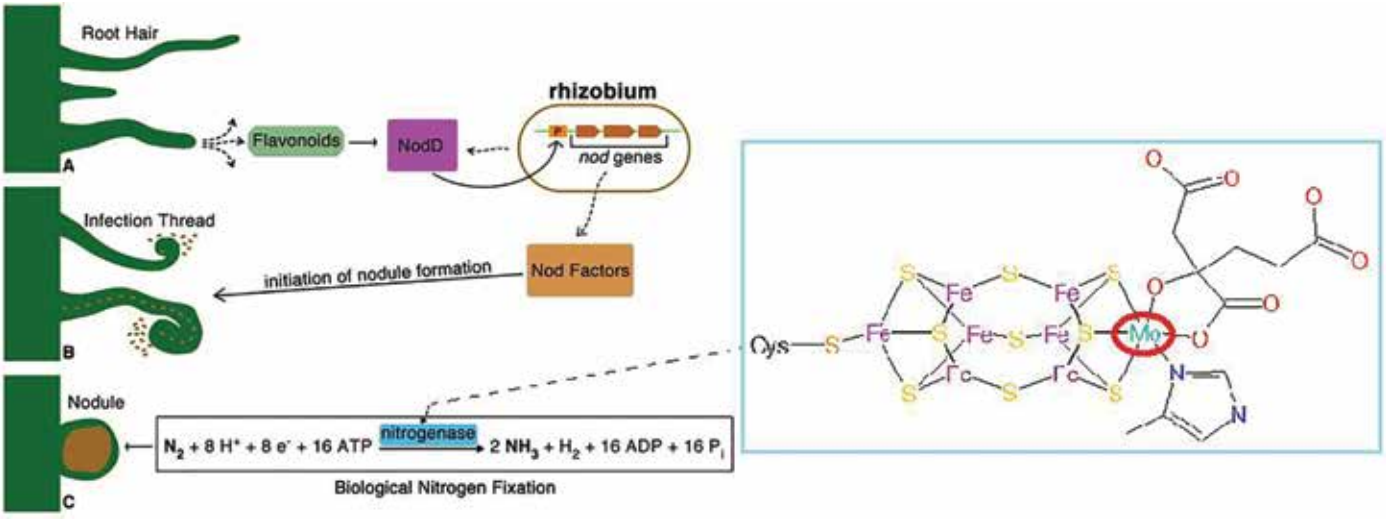

Figure 2: *Nitrogen fixation and the effect of Molybdenum as part of the enzyme catalyst Nitrogenase.*
Source: Marta Laranjoa, Ana Alexandrea, Solange Oliveira, Legume growth-promoting rhizobia: An overview on the Mesorhizobium genus, Microbiological Research Volume 169, Issue 1, 20 January 2014, Pages 2–17

strongly inhibited when Molybdenum concentration reached or surpassed 0.3%, while the growth and proliferation of E cells were suppressed at or above 0.2% Molybdenum application.[12]

Consequently, it is important to realize that the ability of the *Rhizobium* to tolerate heavy metals, especially Molybdenum, largely depends on the strain, as each strain should be treated as an individual. This also applies to the different *Rhizobium* species since *Rhizobium spp.* are crop specific. Suppliers will be able to provide toxicity details on the strain, formulations and application rates, they produce commercially.

Conclusively, biological products are ideal for an integrated pest management (IPM) programme that is trustworthy and cost effective. The producer can apply the biological product in numerous convenient ways such as a foliar spray, soil application or seed treatment.

The problem experienced:

The most widespread example that can be used to demonstrate the importance of biological products is pest/disease/weed resistance to chemicals. Resistance describes the decreased susceptibility of a certain pest (insects and weed) population to a chemical remedy that was previously effective at controlling the pest. Resistance can apply to any living organism.

Helicoverpa armigera (Huber/Cotton Bollworm) is an economically important pest of cotton and vegetable crops. Control is usually achieved with insecticides, especially pyrethroids. In Asia and Australia, H. armigera has developed resistance to virtually all the insecticides that have been applied against it in any quantity (13). In West Africa, Deltamethrin and Cypermethrin susceptibility in H. armigera was surveyed annually from 1984. Pyrethroid resistance was detected in 1996 (13,14). At the same time, pyrethroid resistance was also detected in South Africa (15). A resistance management strategy based on the restriction of Pyrethroid use was quickly implemented on all cotton farms of West African countries (16). Ineffective (resistant) pesticides can lead to unnecessary expenditure on chemicals that will not control the pest effectively. Recently a variety of biocontrol options have been investigated.

Figure 1: *Western tarnished plant bug (Lygus hesperus) killed by the entomopathogenic fungus, Beauveria bassiana (Photo by Surendra Dara)*

The possible solutions:

Micro-organisms:

Alternatively, the use of other biological products has been investigated:

1. The beneficial Fungus *Beauveria bassiana* is registered for the control of whitefly, and the suppression of Res spider mite, False coddling moth, Fall Army Worm, and *Tuta absoluta* on various crops. Commercial tomato producers would certainly know the value of a decrease in yield due to damage (virus) imposed by whitefly vectors in the tomato industry.

2. The *Armigera Nucleopolyhedro-Virus,* offers highly effective control of African Bollworm larvae. It presents producers with a resistance management tool and an ideal biological product for IPM programmes.

Consequently, biological products are ideal for use as preventative pest control products built into an integrated pest management (IPM) programme that is trustworthy and cost effective. The producer can apply the biological product in numerous convenient ways such as a foliar spray, soil application or seed treatment.

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More references on request

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GOOD HARVEST BATTERY POWERED SPRAYER

Technical Specifications:

Tank capacity	16L
Net Weight	8.5Kg
Dimensions:	41cm X 32cm X 68cm
Pump:	12V
	1.4-2A
	2.5-6bar
Motor:	DC-12V
	35W
	2600 -3200 rpm
Battery:	Lead acid
	12V
	12AH
Charger:	110 – 240V
	50/60Hz
	Output 12V DC / 1.7A
Charging time:	8 – 10 Hours
Working time:	10 Hours
Spraying flux:	4 –hole nozzle: 1.5 – 2.2 L/min
	Dreamline nozzle3 L/min
	Double nozzle1.8 – 3.2 L/min

Supplied with four nozzles:

- Fan nozzle normally used for spraying pesticides
- Cone nozzle best for pest control
- Multi-hole nozzle which is suited most for spraying plants and fruit trees
- Dual spray head nozzle

" I have been using one of these sprayers for the past three years, and it has proven to be a reliable and robust unit. The sprayer has been used with a variety of chemicals, adjuvants and fertilizers with no issues. Being a demo model, we thoroughly put the unit through its paces…even submerging it in a cement dam a few times at a trial where a refilling point wasn't available. We have sprayed literally hectares with this unit, only stopping to refill.

The unit is extremely durable even with years of hard use. Other than the battery (which is a standard 12 volt gate motor battery), we have not replaced any parts… not even the seals ! The unit is extremely reliable, robust and user friendly. With the self-regulating pump, every run is the same as the last (no over or under application of agchems). This is in my opinion the best value for money battery sprayer on the market today and it trumps any knapsack sprayer and most name branded units out there "

JJ de Klerk
National Technical Marketing Manager:
Fodder and pasture crops.

For more information, kindly contact Dennis Lange at our Head Office.Cell : 083 293 0185.

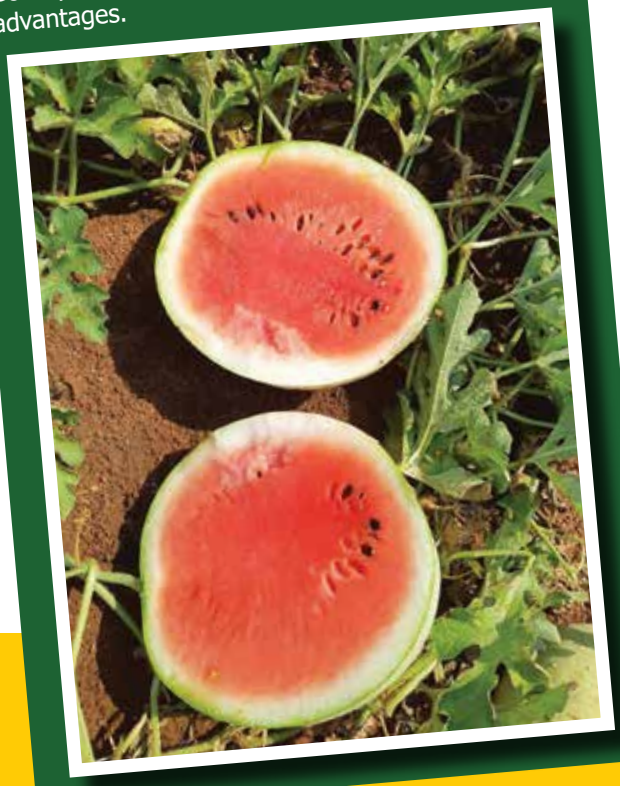
New Varieties – Bushveld

Hygrotech launched a number of new varieties in the Bushveld. These varieties have established themselves in the area and proven to be the farmers ally in the field.

Compiled by Herman de Beer: Area Marketing Manager, Bushveld

Water-melon: Micky Lee

The stallwart is back and welcomed by everybody. Good yield and early maturity are still the greatest advantages.



Melons

Two new Harper types were established.
Avenger and **Hunter** are well accepted by processors and the open market.

Sweetcorn

Escalate / Jubilation and **2269** insure that the growers can plant throughout the year for fresh market as well as processors.

Onions

The two varieties that can hold its ground against most other varieties are **Hazel** and **Hickory.** These varieties can be planted from 25th of February up to 25th of March.

Sweet Peppers

Although numerous varieties were trialed throughout the area, **Rubistar** and **Floyd** are the most impressive varieties. Good leave protection, dark green blocky fruit ideal for loose, box and sleeve market.

Disease package includes:
Xcv 1-3 Bacterial Spot (Bs,)
TMV – Tobacco Mosaic Virus
TSWV – Tomato Spotted Wilt Virus
Mj – Root knot nematodes

Process / Hawker Tomatoes

Qwanto tomato is taking the market by storm with a disease package of V – Verticillium Wilt, F2 – Fusarium Wilt Race 2, BW – Bacterial Wilt, N – Nematodes, BSp – Bacterial speck and Tomato Yellow Leaf Curl Virus. This variety can withstand diseases better than most other varieties.

MILLER® CHEMICAL & FERTILIZER, LLC TRUSTED GLOBAL AGRICULTURAL ADJUVANT LEADER FROM THE USA MAXIMISES PESTICIDE APPLICATION IN SOUTH AFRICA FOR ALMOST HALF A CENTURY

Author: Johann van der Vyver, Director: Miller® Chemical South Africa

Miller® Chemical & Fertilizer, LLC is based in Hanover, Pennsylvania in the USA. In 2017 the company celebrated its 80th anniversary. Through the first two decades Miller® primarily manufactured farm fertilizers, formulated agricultural chemicals and distributed products for large multi-national companies. In the early 1960's Miller® started to develop speciality products and broadened its scope of business for its high quality soluble foliar fertilizers. In 1968 Miller®'s intense experience and understanding of various agricultural chemicals paved the way for Miller® to launch its range of performance-based adjuvants. It started off with the Pinolene® range of products (proprietary terpene polymers from pine resin). Other Miller® adjuvants followed over the years, aiding growers to maximise pesticide efficacy, without harming the environment or crop.

The adjuvant range catapulted Miller® into the international agricultural market. Miller® products are currently marketed and sold in 90 countries worldwide. In South Africa the Miller® products have been available for 46 years. Roode Lyon, founding company of Hygrotech SA, attained exclusive import and principle supply rights in 1972 for Miller® products. Till this day Hygrotech SA is still importing Miller® products and supplying to registered Croplife SA distributors. Technical product back-up is provided to these distributors by Hygrotech Technical Advisors throughout South Africa. The current top four Miller® adjuvants in South Africa are:

NU-FILM® P AND SUSTAIN

Both Nu-Film® P and Sustain® are part of the Pinolene® products and have very similar sticker-spreader registrations according to Act 36 of 1947. Nu-Film® P (Reg. No. L2980) is designed to control the effective lifespan of agricultural chemicals on the plant surface. This happens by means of an immediate effect, as well as an effect over time in conjunction with the agricultural chemical in the spray-tank mix. The immediate effect includes reduction of spray volatility, improved deposition and spreading of spray on the plant surface. Benefits over time include improvement of rain fastness, reducing UV and heat degradation of the agricultural chemical and improving absorption ability of the agricultural chemical by reducing sudden moisture evaporation of the spray from the plant surface after application. Sustain® (Reg. No. L7690) in comparison is especially designed to be used with soil applied agricultural products. It is ideally suited for root and shoot active herbicides and pre-emergence soil applied herbicides which may be susceptible to environmental conditions such as UV light degradation and leaching of soil applied herbicides.

MIST CONTROL®

Mist Control® (Reg. No. L4567 of Act 36 of 1947) is an effective, easy to use adjuvant for drift retardation and deposition of agricultural crop sprays. Mist Control® is ideally suited to be used with herbicide applications to reduce the risk of spray drifting away from the intended target. The latter can result in reduced weed control or even worse, cause damage to other crops not earmarked for the herbicide application. Mist Control®'s high level of efficacy is emphasised by its approval in the USA as a "Drift Reduction Agent – DRA" by an obligated Environmental Protection Agency (EPA) test protocol for use with the newest Dicamba containing herbicide formulations of various companies.

ENTRÉE

Entrée (Reg. No. L8055 of Act 36 of 1947) is an adjuvant that improves initial adhering and spreading of the agricultural spray on the plant surface (grass and broad-leaved plants). The product's ability to especially increase movement of systemic products into plant tissue makes it an ideal spray-tank partner for such herbicides. A unique Entrée characteristic is its design to be used with oil or water based agricultural chemicals. This allows for the agricultural chemical to move into plant tissue via oil or water-soluble areas of the leaf, accelerating uptake. Entrée reduces crystallization of the agricultural chemical on the plant surface, extending absorption time. Internationally Entrée is marketed as Exit®. The popularity of Exit® efficacy in the USA was confirmed by independent figures from the State of California. In 2015 and 2016, Exit® was the most used adjuvant over a variety of 168 crops which included 382 200 ha (2015) and 364 217 ha (2016) respectively.

MORE ACCURATE HERBICIDE APPLICATIONS WITH RENOWNED ADJUVANTS

MIST CONTROL®
Drift Retardant and Deposition Aid for Pesticide Sprays

Sustain®

ENTRÉE

MILLER®

ALWAYS REFER AND ADHERE TO PRODUCT LABELS INFORMATION AND RATES WHEN USING THESE PRODUCTS
Mist Control® and Sustain® are trademarks of Miller Chemical & Fertilizer, LLC in Hanover, Pennsylvania.
Mist Control® contains 20 g/L Polyvinyl polymer. Reg. No. L4567of Act 36 of 1947
Sustain® contains 875 g/L Poly-1-p-menthene. Reg. No. L7690 of Act 36 of 1947.
Entree contains 819 g/L vegetable oil. Reg. No. L8055 of Act 36 of 1947
Hygrotech South Africa (Pty) Ltd is the principal supplier of these products
Hygrotech SA contact number: +27 12 545 8000

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GREAT SUCCESS with Baby Marrows in the Lowveld

By Lodewyk van Staden, Sales Representative, Nelspruit/Lowveld

During the past season, Hygrotech and Seedcor trialed a diversity of new zucchini varieties in the Lowveld area, of which 2 cultivars stood out, namely **RAGNAR F1** and **GUNNSTEIN F1**. These highly disease resistant varieties have the capacity to bear excellent quality fruit over a longer period of time than standard varieties, resulting in higher yields!

Ragnar F1

Compact plant with dark green fruit.
Disease resistance: ZYMV, CMV, WMV and Px.

Morne Pretorius of Barberton, Mpumalanga standing in his impressive Ragnar F1 field.

Excellent leaf cover of Ragnar F1.

Dark green, high quality Ragnar F1 fruit.

Gunnstein F1

Compact plant with dark green fruit.
Disease resistance: ZYMV, CMV, WMV and Px.

Beautiful Gunnstein F1 ready for the pack shed.

The flower of Gunnstein F1 brakes off easily which leaves a typical small blossom end.

Strong Gunnstein F1 plants with their excellent leaf cover

Flower-end lesion comparisons

The following data was obtained by weighing and measuring a few fruits per variety.

Average fruit length, diameter and weight:

Gunnstein F1

Fruit 1:	**Fruit 2:**
Length = 11 cm	Length = 12 cm
Diameter = 2,6 cm	Diameter = 2,7 cm
Weight = 52 g	Weight = 70 g

Control variety F1

Fruit 1:	**Fruit 2:**
Length = 11 cm	Length = 12 cm
Diameter = 2,2 cm	Diameter = 2,4 cm
Weight = 42 g	Weight = 58 g

Ragnar F1

Fruit 1:	**Fruit 2:**
Length = 11 cm	Length = 12 cm
Diameter = 2,6 cm	Diameter = 2,6 cm
Weight = 50 g	Weight = 58 g

For more information, kindly contact Lodewyk van Staden at 082 926 3450

Small blossom-end comparisons after picking

CONTROL Gunnstein F1 Ragnar F1

SELECTING THE RIGHT FORAGE CEREAL

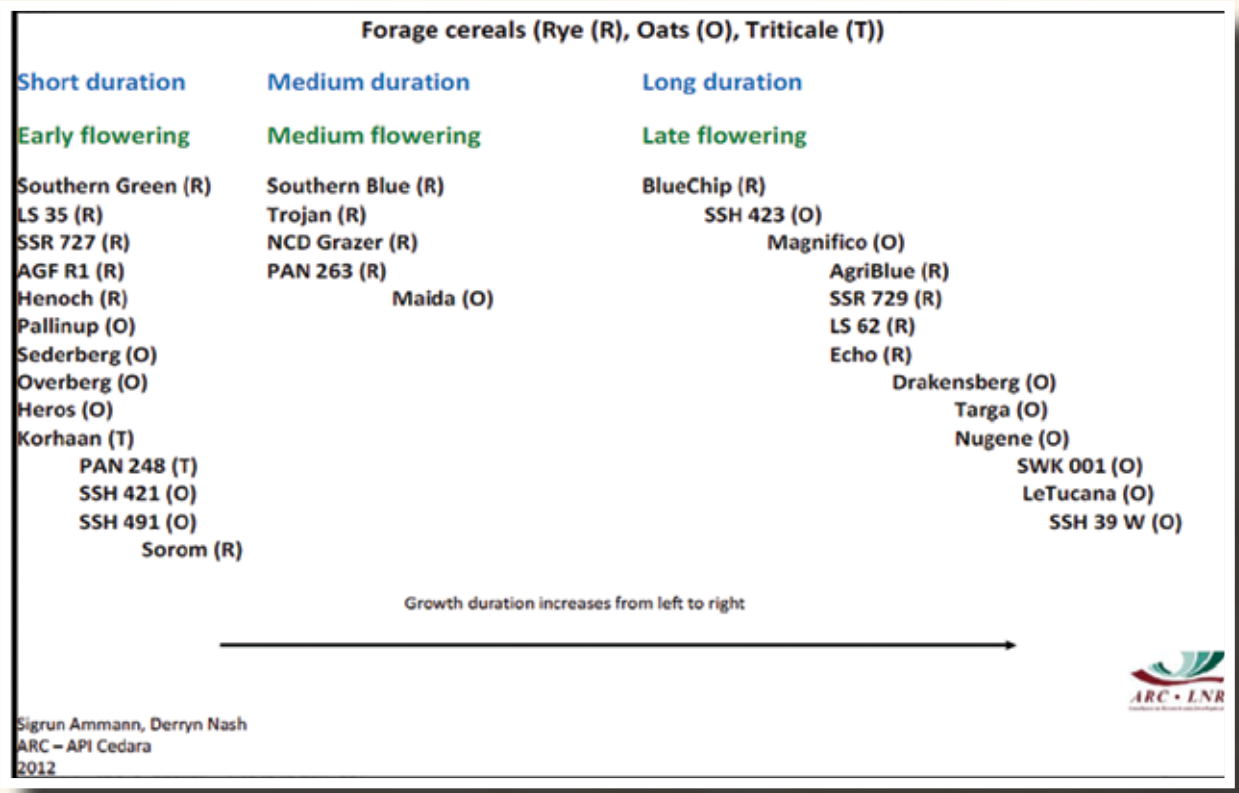
Written by JJ de Klerk – National Technical Manager: Fodder and pasture crops

As with most pasture crops farmers are inundated with marketing material from all corners, all boasting to be the right choice for their operation. But how does one make sense of a stack of brochures? Here is one such a solution for selecting the right forage cereal or rye for your stock demand.

Cereals (milling oats, wheat, barley) and forage cereals (rye, stooling rye, black and white oats, triticale) have long been a staple as winter pasture, hay or silage crop. But things tend to get tricky when one is confronted with different species such as white and black oats, and even more so with the vast array of varieties on the market.

For this segment we will be focussing on rye. These are classed according to duration or cycle and type i.e. spring or winter types. Winter types

Characterization of varieties according to flowering and growth duration: Growth duration increases from left to right. Below is a table to see how your current variety slots into those exclusively distributed by Hygrotech.



From article: 'Forage cereals for dryland pasture production' Sigrun Ammann and Derryn Nash, ARC Cedara, KZN

require vernalisation to induce flowering whereas spring types do not. For this reason spring types are all short cycle and winter types are either medium or long cycle. The classification according to type and duration is key when assessing a specific variety for its viability in a fodder flow programme.

Hygrotech has 4 rye varieties in its stable namely LS 35, LS 62 and two new varieties currently under commercial evaluation under their codes HTF 102 and HTF 103.

LS 35 has long been a stalwart in the forage cereal market and is well known for its ability to produce feed very quickly. For this reason it is an ideal candidate to mix with rye grass pastures to stand as a nurse crop or in periods where feed or land is limited and a quick fodder crop is needed. LS 35 is therefore a spring type with short duration, meaning it will go to seed if not managed closely and does not require a cold spell with change in light hours to initiate seeding.

Next in line is HTF 102, a new variety being tested in the KZN midlands area. HTF 102 is currently being classed as a winter type with medium duration or cycle. It is somewhat slower out of the gate than LS 35 but will yield later into the season.

LS 62 is next in line and is a true winter type with a long cycle. LS 62 is initially very slow compared to LS 35, but picks up speed as the season progresses and comes to its own mid to late winter. LS 62 is therefore suited to operations that has a higher feed demand in this period or has to get more grazing from their cereal as spring types tend to be less palatable and less productive this time of year.

Lastly, our longest cycle rye is HTF 103. Much slower than LS 62, HTF 103 will be most active late winter and into spring. Despite having a very limited application, HTF 103 will be well suited to lay over pastures and marginal lands where a fodder bank is being built.

For more info on these and other forage cereals supplied by Hygrotech contact your local representative or send us a mail at voerenweiding@hygrotech.co.za

Spread your risk with Water-melon cultivar choices

Written by Hugo Burger, Technical Manager, Stellenbasch, Western Cape

Cultivar choice with water-melons is mostly determined by the end user. As known already, the supermarkets prefer a medium size water-melon of between 8 – 12 kg. Some supermarkets though, prefer smaller types of more or less 6 kg. This is produced on contract against a premium.

The most important link in the water-melon industry is the producer. The cultivars launched every year must therefore meet the requirements by producing good yields, strong and healthy plants, be able to handle difficult climatic conditions, and be able to produce good eating qualities which are acceptable to the broad public. Good yields are determined by the size of the fruit and the quantity produced.

Crimson Sweet type cultivars are the most popular in the Eastern-, Western- and Northern Cape as well as in Namibia. Carmen is one of the first **Crimson Sweet** hybrids that have been launched with great success. **Carmen** is still the preferred cultivar with producers because of its good adaptability and excellent yields.

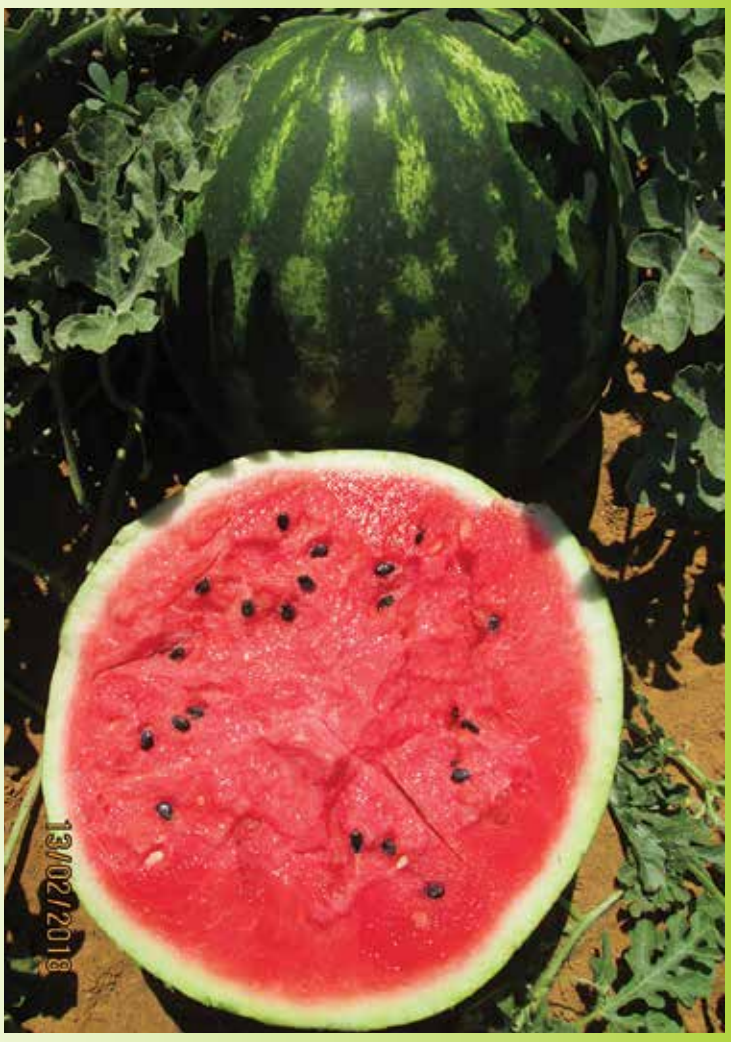
After successful semi-commercial trials last year in the Western Cape, we have been able to enter the market with confidence this year with 2 new hybrids.

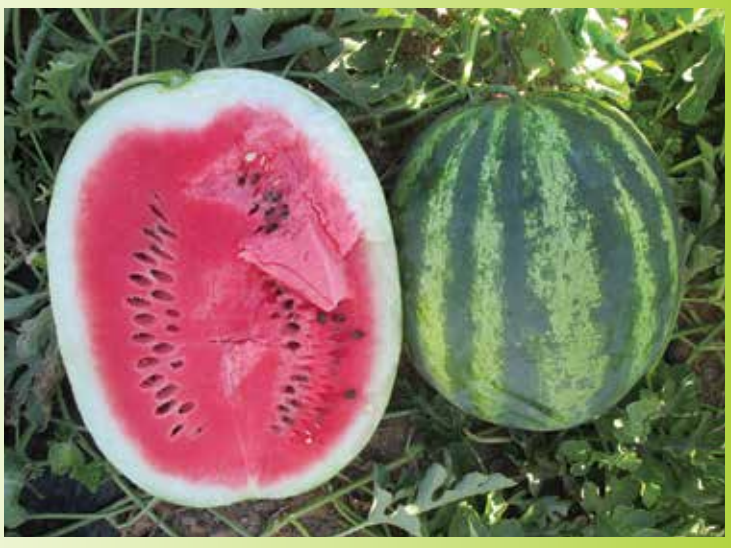
Uhlenhorst and **Rocky Ford** come from the same breeding programme as **Carmen**, but with improved flesh colour and internal quality. What makes these 3 cultivars so exceptional, is that they have different growth periods. **Uhlenhorst,** with its big seeds, germinates easier in cold conditions and can therefore be planted earlier than **Carmen** and **Rocky Ford. Uhlenhorst's** growth period is 10 days quicker than **Rocky Ford** and 5 days quicker than **Carmen. Rocky Ford** has smaller seeds and is therefore more suitable for plantings during the main season. If all 3 cultivars are planted together, the harvesting process is much easier i.e. **Uhlenhorst** is harvested first, then **Carmen** and lastly **Rocky Ford.** Your risk is therefore well spread with cultivars which supplement each other regarding growth period, fruit quality and yield.

Uhlenhorst weighs between 10 – 12 kg, with firm red flesh and a thick peel. This thick peel is beneficial when fruits are transported over long distance. 'n Brix of 12 is easily achieved.

Rocky Ford weighs more or less 14 kg, with an attractive appearance regarding peel/skin colour. The flesh colour is deep red and firm with a brix of 12.5.

These new generation water-melon cultivars are a step forward and advantageous for everyone in the food chain.





SUPERB GRAZING AND FORAGE OPTIONS

Compiled by Robert Young - Area Marketing Manager: George, Southern Cape.

Hybrid ryerass *(Lolium x boucheanum Kunth)*
Storm and Bastile
Hybrid ryegrass is a cross between Perennial ryegrass and Italian ryegrass, combining the parental properties to various degrees. Some hybrid ryegrass varieties resemble perennial ryegrass, other Italian ryegrass, and others again are transitional forms.

DLF has specialized in creating varieties of Hybrid ryegrass, which combine the persistence of Perennial ryegrass with a feed quality approximating that of Italian ryegrass. These hybrid ryegrass varieties are particularly suited to grazing in early spring, when production is greater than that of Perennial tyegrass and, with their smaller number of stems, better than Italian ryegrass in the latter part of the season. This means less wasted grass. Hybrids are more drought tolerant than both Perennial and Italian ryegrass.

Tall Fescue *(Festuca arundinacea L.)*
Kora
With a large deep root network, tall fescue is a very drought and heat tolerant grass, producing feed n periods when other grasses have stopped growing. The leaves are generally quite course, and there are major differences in the varieties' ability to tolerate frost. Tall fescue is used especially for cutting and grazing in hot and dry conditions, but **DLF** has also developed very winter hardly varieties suitable for the northern parts of Europe.

Cocksfoot *(Dactylis glomerate L.)*
Athos
Cocksfoot is a very robust and drought tolerant grass. The growth starts early in spring, and stem formation is almost exclusively at the first cut in spring.

Cocksfoot is very winter hardly after establishment. Traditional types are rather aggressive in mixtures with other grasses, but **DLF** has developed varieties which combine the ability to produce quality grass with fewer stems under dry conditions and with less aggressiveness towards other grasses.

White clover *(Trifolium repens l.)*
Klondike
White clover is a valuable resource in the grass field as it increases the quality and digestibility of the feed, gives a better taste, and increases the animals daily feed intake. Varieties with small leaves are particularly robust under grazing, while large leaved varieties are most productive when used for cutting.

After establishment, the plants spread with stolons, which can take root. This is one of the reasons why White clover tolerates grazing very well. As White clover can also survive the winter and is susceptible to few serious diseases, it is a durable plant in the grass field.

Red Clover *(Trifolium pretense L.)*
Rajah
Red Clover is an important component in 2-3 year clover grass fields. The species tolerates less frequent grazing and therefore is best suited for cutting. With its long taproot, red vlover is very drought tolerant, and thrives on a large number of soils (but not on very light or waterloggend soils).

Red clover is normally used to give a very hight yield when mixed with hight producing grasses and, as red clover is a legume, application of nitrogen fertilizer can be reduced in a well established clover grass crop. Also feed quality and intake are improved when red clover is part of the mixture.

Lucerne *(alfalfa) (Medicago sativa L.)*
HL 9
Lucerne is a forage legume known worldwide for its ability to produce forage under a wide range of climatic conditions – not least in dry areas. Lucerne is used for cutting, producing hay or silage and the plant forms a very deep taproot, which enables the Lucerne to tolerate dry periods.

Lucerne has a high level of protein, and as a legume it does nog require mineral nitrogen fertilizer. However, the seed must normally be inoculated with RHIZOBIUM bacteria in order to ensure the adequate nitrogen supply through the root nodules.

Information obtained from **DLF: "More milk from grass"**

NITROSPRAY PLUS

Compiled by Pieter Vorster - Fertagchem Technical Manager, Gauteng

What is Nitrospray Plus?

Nitrospray Plus is a water soluble 7:3:1 nutrient solution with chelated cation micro elements and cytokinins which can be used as a vegetative stimulant or growth stimulant.

When to Nitrospray Plus?

Nitrospray Plus is formulated to stimulate growth during the vegetative growth stage or first crucial weeks after transplanting seedlings or young trees. It also stimulates growth of old established crops where growth is slow.

Why Nitrospray Plus?

It has promising results and it gives your crop a healthy start.

What is cytokinins?

Cytokinins are one of the 5 major classes of plant hormones. In general, plant hormones control every aspect of plant growth and development. Plant hormones are produced in very small concentrations, but even a minute amount can have a profound effect. Reactions to plant hormones always depend on their relative concentrations compared to other hormones present. It is the hormonal balance that controls the growth and development of each plant. Cytokininss and auxins were the first plant hormones detected. Cytokinins is the key plant hormone as it not only initiates different effects, but also controls the action of all other plant hormones like auxins and gibberellin. Cytokinins prevent ageing of plant tissue. It prevents chlorophyll bleaching and maintaining of protein, RNA, DNA and nucleic acid synthesis, therefore the plant does not deteriorate.

Key effects are:
- Cell enlargement and stem growth
- Root initiation and bud initiation
- Leave development and enlargement
- Apical dominance

Balance of auxins and cytokinins:
In the 1950's a series of experiments showed how the ratio between auxin and cytokinins works. If auxin is added to a plant then the cells grow very large but they don't divide. If cytokinins are added - and auxin is present - then the plant cells divide. Therefore, the ratio of auxin to cytokinins determines how the cells will differentiate. In young plants, a surplus of auxin will initiate root growth. A higher concentration of cytokinins will support the development of shoots and shoot buds. If the concentrations of both are equal then the plant cells will grow but will remain undifferentiated. The exogenous application of auxin will promote root growth and initiate the synthesis of cytokinins in the root meristem. These freshly produced cytokinins will signal the plant to grow more shoots, leading to a naturally balanced bigger and stronger plant.

Nitrospray Plus results on green beans

Nitrospray Plus results on sugar cane

Nitrospray Plus results on beetroot

Crop	Sucrose % increase	Sucrose increase Ton/ha	Yield increase/ha
Sugarcane	1.4	5,88	32,57 ton
Banana			3,71 ton
Wheat			420 kg
Carrots			26,7%

*Summary of trial results conducted with Nitrospray Plus in respected production areas.

The cytokinins-like activity and nitrogen dominated extract stimulates prolific adventitious vegetative growth when **Nitrospray Plus** is applied to almost any plant. This drastic increase in root tips leads to an increased level of cytokinins in treated plants, as this group of hormones is mainly produced in root tips. The increased root volume and number of root tips also increase moisture and nutrient uptake from the soil.

The improved nutrient status together with the higher level of cytokinins in the plant give better top growth that causes the increase in yield and quality of crops. The improved root system also makes the plant more resistant to stresses such as drought, waterlogging, soil nutrient deficiency and salinity, nematode infestations and soil borne diseases.

Nitrospray Plus applied to plants also produces plants with a stronger root system, showing enhanced resistance. **Nitrospray Plus** efficiency as a cost effective agricultural fertiliser has been proven in numerous programmes under differing climatic conditions and on a wide variety of crops. **Nitrospray Plus** has a broad application base, is easy to apply and is compatible with most crop protection chemicals and foliar feeds. Its consistency in result and cost efficiency has led to its position in the market.

How to apply Nitrospray Plus?

Nitrospray Plus can be applied as foliar spray on seedlings, adult plants or trees in the vegetative growth stage. It is compatible with most fungicides and pesticides except those who contain large amounts of copper or sulphur and alkaline materials. See the leaflet for the dosage of different applications and more information.

Research Results
Nitrospray Plus was applied as follows:
Sugarcane – 3L/ha – 30cm plant height and 14 days later
Banana – 1L/200L water and 250ml/plant soil drench.
Wheat – 2L/ha – at stool stage and 14 days later.
Carrot – 2ml/L water at true leaf stage and 14 days later.

Komatipoort Information Day 2018

- Blessed with Rain

Hygrotech clients and personnel from Tzaneen area, Mpumalanga, Kwazulu-Natal; as well as clients from Mozambique and Swaziland attended our annual Information day at JF Steyn Boerdery, Komatipoort. Jakkals Steyn and his sons Francois and Ruan were thanked for a beautiful trial and hosting our information day on their farm.

Blessed with long awaited rain, we started proceedings with an excellent display of our varieties from the trial with technical staff on hand to assist in the packing shed of Mr Jakkals Steyn.

As soon as the rain stopped, our on-farm trial with commercial and new varieties under evaluation, was visited. With several new sweet peppers, tomato and chilli varieties proudly presented, and with a well-attended information day, we concluded the day with a braai for our clients.

Some of the attendees of the Hygrotech Komatipoort Information day.

To the right: Lodewyk van Staden (Hygrotech Nelspruit), Quinton Tarr (Hygrotech KZN) and Pieter Vorster (Strydomsblok,Komatipoort) at the display. To the left Dr Martin Maboko from Hygrotech Head Office.

Christo le Grange (National Product Develop Manager-Hygrotech) discusses the new Lunchbox sweet pepper with Kobus van Staden (Strydomsblok, Komatipoort).

Lodewyk van Staden (Hygrotech Nelspruit) discusses a new sweet pepper variety with Cathy, Lena and Mrs. de Jager from Burgersford.

Many varieties of sweet peppers in the trial at JF Steyn Boerdery were on display.

HYGROTECH SUSTAINABLE SOLUTIONS

A beautiful display of Hygrotech and Seedcor varieties from the trial at JF Steyn Boerdery, Komatipoort.

Christo le Grange (National Product Develop Manager-Hygrotech) answering questions from farmers on new varieties on display

Habe Roode (Hygrotech) having a tomato discussion with Anton Lombard (right) from Parma Nursery, Hoedspruit.

Rajen Rajcoomher (Hygrotech KZN) (far right) with guests at the Information day.

A Hygrotech team of 15 personnel worked hard to make the Komatipoort Information day a success. Christo le Grange, Habe Roode, Henry Coetzer (all from Hygrotech Head Office) and Michael Luttig (Hygrotech Nelspruit) took a break before our clients arrived.

Hygrotech personnel would like to express their gratitude to Jakkals Steyn (right), and sons Francois (middle) and Ruan (left) from JF Steyn Boerdery, Strydomsblok, Komatipoort for supporting vegetable variety trials on their farm.

2018

PERLKA ROADSHOW
A HUGE SUCCESS

Compiled by JJ de Klerk: National Technical Marketing Manager - Fodder & Pasture crops

We recently held our 2018 Perlka roadshow along with Martin Eberly (Global product manager) from Alzchem based in Germany. A hard week of traveling just under 3000 km to Kimberley, Komatipoort, Tzaneen, Waterpoort and Brits to present to more than 60 farmers, not including Hygrotech sales staff, was surely worth the effort.

Our route for the five days ±3000 km

Our first stop was at the offices of Wes Gro potato seed growers who is the largest potato seed supplier in South Africa. Martin presented Perlka and the benefits of the product when used on potatoes to a group of farmers, Wes Gro representatives and Oosie Joubert from Intelligro who will be the sole retailer of Perlka to Jan Kempdorp and surrounding areas.

Next stop was at farmers in the Komatipoort area. Here we met with Fielies Kotze who will be testing Perlka on his Papaya trees as well as including it in a tomato trial.

We also visited the farms of Quintin Nel and Pieter Vorster who have both tested Perlka before on peppers and baby spinach respectively. Both had informative comments and gave great feedback to Martin on their application of the product. Martin in turn recommended a few tweaks to be made to their farming practices and we are expectantly awaiting repeat trials with even better results.

Our next stop was to the farm of Beer Seun just outside Tzaneen where we met up with farm managers and owners alike form the area. This time around the discussion revolved around the benefits Perlka could have on their crops, but specifically focussing on sweetcorn. We are keen to start trials in this area on sweetcorn and other crops to show what Perlka can bring to the table.

Martin explaining the slow release rate of Perlka compared to Urea at the Wes Gro offices

From there we moved on to the farm of Mannetjie Storm. Martin had his hands full juggeling questions on a wide range of crops and agricultural practices. With a broad spectrum of application methods used and suggested by current and prospective clients we could confirm that the product had its place irrespective of the end user. The main crop focus was tomatoes and cantaloupe. With very positive comments from a current client, we finished the day on a high. We even had a side bet between our representative Henno

Michael Luttig (Area Marketing Manager: Nelspruit), Fielies Kotze and Martin

Martin explaing the breakdown and Nitrification of Perlka in the soil

Breytenbach and one of his clients to see if Perlka can deliver on all its promises.

Our last stop was to a stormy and wet Brits. We were fortunate to have a mixed bag of farmers all with very unique challenges due to the array of crops being cultivated - from tobacco, peppers, onions, cabbage etc. Martin fielded all the questions with confidence and had a slide or two with statistical data or trials to prove his point.

All in all it was a very taxing but valuable roadshow, with 50 odd new farmers having heard about the benefits of using Perlka in their day to day operations and the benefits they can come to expect.

We would like to thank Martin for sharing his boat loads of experience with current and new clients and taking the time to sharpen our own knowledge of the product. We look forward to an exciting season with numerous in house and independent trials being done on veg, tree and row crops all over the central and northern regions.

Martin starting his presentation in Waterpoort

A special word of thanks to our valued clients who attended these days with their respective representatives. Your time and inputs were greatly appreciated. Good luck and may Perlka be all we said it would be!

Producers, Hygrotech Representatives and Martin after his last presentation in Brits

PERLKA YIELD RESULTS ON PEPPERS AND CHILLIES

Compiled by JJ de Klerk: National Technical Marketing Manager - Fodder & Pasture crops

Perlka (Calcium Cyanamide) is a slow release Nitrogen granular fertilizer that also supplies Calcium and Carbon when applied to the soil. We recently concluded two trials in the Brits area on sweet peppers and chilies to demonstrate the effectiveness of the product. The chillies were treated at 500 kg/ha and broadcast spread as per recommendation and washed into the profile. Whereas the peppers were treated with a new method, where the Perlka was band placed on the ridge at a lower actual rate per hectare to determine if a cost saving can be made and justified in terms of yield increase.Here are the results as taken from the trial reports:

CHILLIES

Perlka was broadcast over two beds at a rate of 500 kg/ha. The Perlka was then washed in with irrigation and was not worked into the soil as per recommendation. The seedlings were transplanted 10 days post application.

The control and treated blocks were harvested on two separate occasions. Forty plants were harvested on the first harvest and 100 plants per block were counted out on the second harvested. Red and green fruits were harvested and evaluated separately. Each fruit was weighed individually to determine average fruit size. Plants were harvested by on farm staff to ensure a true harvest. All the data was combined and evaluated as a whole to determine if Perlka did improve yield and profit per ha.

RESULTS AND FINDINGS:
YIELD EVALUATION:

	SECOND HARVEST				FIRST HARVEST				TOTAL	
	CONTROL	PERLKA	CONTROL	PERLKA	CONTROL	PERLKA	CONTROL	PERLKA	CONTROL	PERLKA
	RED FRUIT		GREEN FRUIT		RED FRUIT		GREEN FRUIT			
PLANTS HARVESTED	100.0		100.0		40.0		40.0		140.0	
NUMBER OF FRUIT	12.0	48.0	285.0	683.0	15.0	23.0	92.0	235.0	404.0	989.0
TOTAL WEIGHT (g)	215.0	1421.0	8742.0	24842.0	697.0	752.0	3177.0	5341.0	12 831.0	32 356.0
AVERAGE WEIGHT (g)	17.9	29.6	30.7	36.4	46.5	32.7	34.5	22.7	32.4	30.3

The Perlka treated block yielded a total of 585 more fruit than the control. An increase of 144% in total yield. The Perlka treated block yielded 32.356kg compared to the 12.831kg on the control block. This is an increase of 152% on marketable yield. Average fruit size was comparable with the control block yielding slightly larger average fruit of 32.4g versus the 30.3 grams of the Perlka treated plants.

The control block yielded 27 red fruit and 377 green fruit. Whereas the Perlka treated plants yielded 71 red and 918 green fruit. This is an increase of 162% on the red fruit and 143% on the green fruit for the Perlka treated block.
Average number of fruit per plant over two harvests for the control block was 2.88 versus 7.06 on the Perlka treated side.

COST EVALUATION

Using on farm averages and the above figures the following **estimates** could be made to evaluate the return on investment of Perlka:

- Fields are planted with ±40 000 plants. If each plant yields on average 7.06 fruit with an average weight of 30.3 grams **over 6 harvests,** the Perlka treated block would have yielded approximately 51 340 kg of fruit.
- Compared to the control block with 2.88 fruit per plant per harvest, with an average weight of 32.4 grams, the untreated control would have yielded 22 394 kg of marketable fruit.
- With a current average market price of R 7 000.00 per ton, this equates to an increase in turnover per ha of R 202 622.00 per ha.

***Above figures are only pertinent to the treated and control block and should only be used as a reference to the relevant case study. Variances over the field could not be accounted for.**

PEPPERS

Definitions

Actual rate: The actual weight of product applied on a per hectare basis.
Effective rate: The actual rate per hectare when derived from the rate applied in the ridge.

Perlka was broadcast spread over the ridge by means of a mini fertilizer spreader and incorporated to a depth of 150-200mm. With ridges spaced at 1,8 meters and a width of 500 mm the actual treated area came to 2750m². Therefore at an actual rate of 280 kg/ha Perlka this amounts to 101,8 g/m² in the ridge or an effective rate of 1 018 kg/ha.

Calculation

100 m ÷ 1.8 m (Distance between ridges) = ± 55 ridges per hectare
55 ridges × 0.5 m (Ridge width) × 100 m =2 750 m² ridge per hectare
280 kg/ha (Actual rate) ÷ 2 750 m² × 10 000 = 1 018 kg/ha (Effective rate)

- The ridges were irrigated by means of dripper line and kept at field capacity for 16 days. Thereafter the sweet pepper seedlings were transplanted and managed as per the usual on the farm programme. The standard fertilizer programme was maintained on both the treated and control blocks.
- Three rows of 10 meters each were measured out at random positions throughout the two plots and harvested separately on four occasions. The corresponding rows for the control and treated block were used at each harvest to reduce the possibility of soil variation.
- Fruit were weighed individually to calculate the average weight.

RESULTS AND FINDINGS:
YIELD EVALUATION:

Summarized data over four harvests at two week intervals:

FIRST HARVEST		SECOND HARVEST		THIRD HARVEST		FOURTH HARVEST		TOTAL	
PERLKA	CONTROL	PERLKA	CONTROL	PERLKA	CONTROL	PERLKA	CONTROL	PERLKA	CONTROL
NUMBER OF PLANTS HARVESTED									
161	158	146	148	144	146	140	140	591	592
NUMBER OF FRUIT									
33	34	36	13	23	6	16	32	108	85
TOTAL WEIGHT									
4483	4327	5290	2320	3199	816	2218	4521	15.19	11.984
AVERAGE WEIGHT									
135.848	127.265	146.944	178.462	139.087	136.000	138.625	141.281	140.648	140.988

The number of plants varied per harvest but were comparable after the fourth harvest. Therefore the total data values between the two treatments could be compared without bias. There was a 27.05 % increase in the number of total marketable fruit over the four harvests.

Both blocks had a similar average weight of marketable fruit over the four harvests of 140 grams per fruit.
The Perlka block out yielded the control by 3.206 kg or 26.75% for total weight of marketable fruit.

On-farm figures as captured by the manager, are as follows:

- Perlka @ 0.8 ha yielded 15 062 kg or 18 827.50 kg/ha
- Control @ 0.3 ha yielded 4364 kg or 14 546.67 kg/ha
- This is an increase of 29.42 % which correlates closely to the data drawn from the test plots.

COST EVALUATION

At a current average market price for green peppers of R 5 700.00 per ton, with an increase in yield of 4 280.83 kg/ha on the Perlka treated plot compared to the control, the Perlka treated plot yielded an increase in turnover of R 24 400.73/ha. If the cost of the Perlka at 280kg/ha (±R 3 920.00) is subtracted, this equates to a nett profit of R 20 480.73/ha.

For more on these trials and the use of Perlka in your farming operation, contact your local representative or drop us a mail at voerenweiding@hygrotech.co.za

SWEET PEPPER SUCCESS

Written by Phillip Mans, Sales Representative, Western Cape

The quest to find new sweet pepper varieties for tunnel and net-house production, was a big challenge for Hygrotech in 2017. After the trial results in the Western Cape were screened and finalized, we were able to decide on a few new and exciting cultivars.

The trials were planted in December 2017 and ended in October 2018. These trials were positioned directly next to varieties from opposition companies and our cultivars stood out in terms of disease package and yields. Two new Under Protection varieties stood out clearly in the trials, namely **16672** and **16682.** These pepper varieties are from the USA, but were bred by Spanish breeders.

16672 has a very good disease package which includes Tomato Mosaic Virus (TMV), Tomato Spotted Wilt Virus. (TSWV), Powdery Mildew (PM) and Southern Root- knot Nematode (N-1). Powdery Mildew was spotted at the opposition varieties, whilst **16672** and **16682** had no signs of this disease. All varieties had the same treatment and stood in the same greenhouse (with 2 stems trellised).

16672 is a blocky bell-type sweet pepper with a trial weight of between 216 – 244 gram. It has a dark red colour and thick walls. **16682** disease package includes TMV, TSWV. This cultivar is a blocky bell-type sweet pepper with a weight of between 210 – 250 gram. It has a dark red colour and thick walls. Both plants had short internodes in the trials, throughout summer and winter. **16672** is strongly recommended where disease pressure is a problem.

16672

16682

16672

COMPETITION VARIETY

16682

COMPETITION VARIETY

The net-house peppers that stood out from the rest, were **Taylor** and **Felix.**

Both have been trialed by leading sweet pepper producers.

Taylor is a blocky sweet pepper which changes colour from green to bright red. Its disease package includes: TSWV, TMV2, PVY. It has thick walls and weighs between 160 – 200 gram. The plant has good leaf coverage and protects the fruit against sun burn.

In the trials, we also observed that **Taylor** had much less flower-end-rot and that the pack-out was much higher than the opposition varieties. Taylor has the ability to set a lot of fruit. In the trial, **Taylor** was trellised in 2 ways and both resulted in excellent ratings in terms of production/yield and quality.

TAYLOR

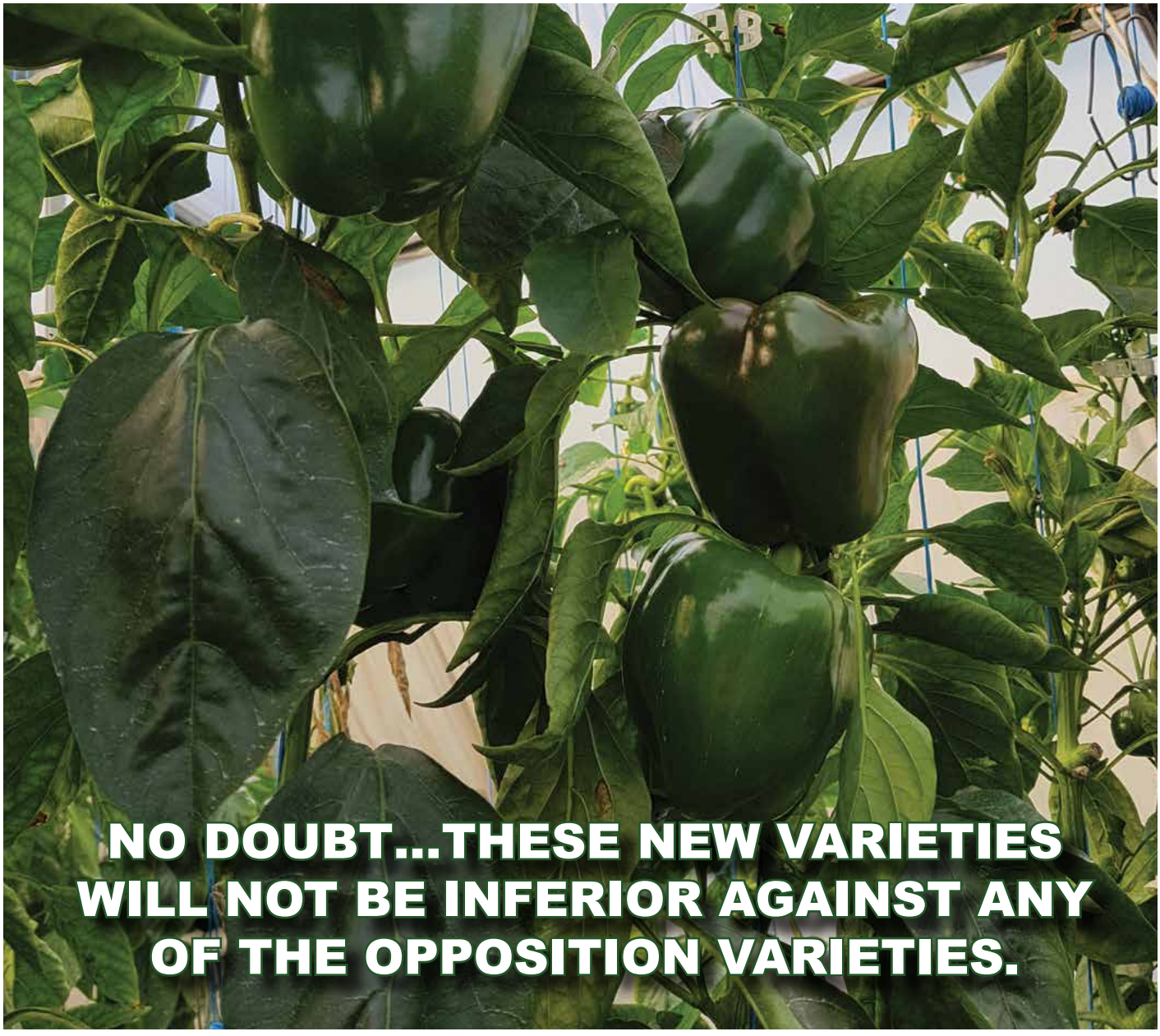
FELIX

Felix is a blocky sweet pepper which changes from green to yellow. Its disease package includes: TSWV, TMV2 and PVY.

Felix stood out in terms of production/ yield and disease package. Felix has thick walls and weighs between 160 – 210 gram. The plant has a good leaf coverage and protects the fruit against sun burn. This is a high quality sweet pepper !

Felix is a strong grower, it sets a lot of fruit and was quicker 'out of the blocks' compared to the other varieties is the trial.

For further information, kindly contact Phillip Mans on 084 620 9668



Gourmet Extreme

Written by Liana Erasmus, Manager: Special Projects, Hygrotech

Tomato season is here!

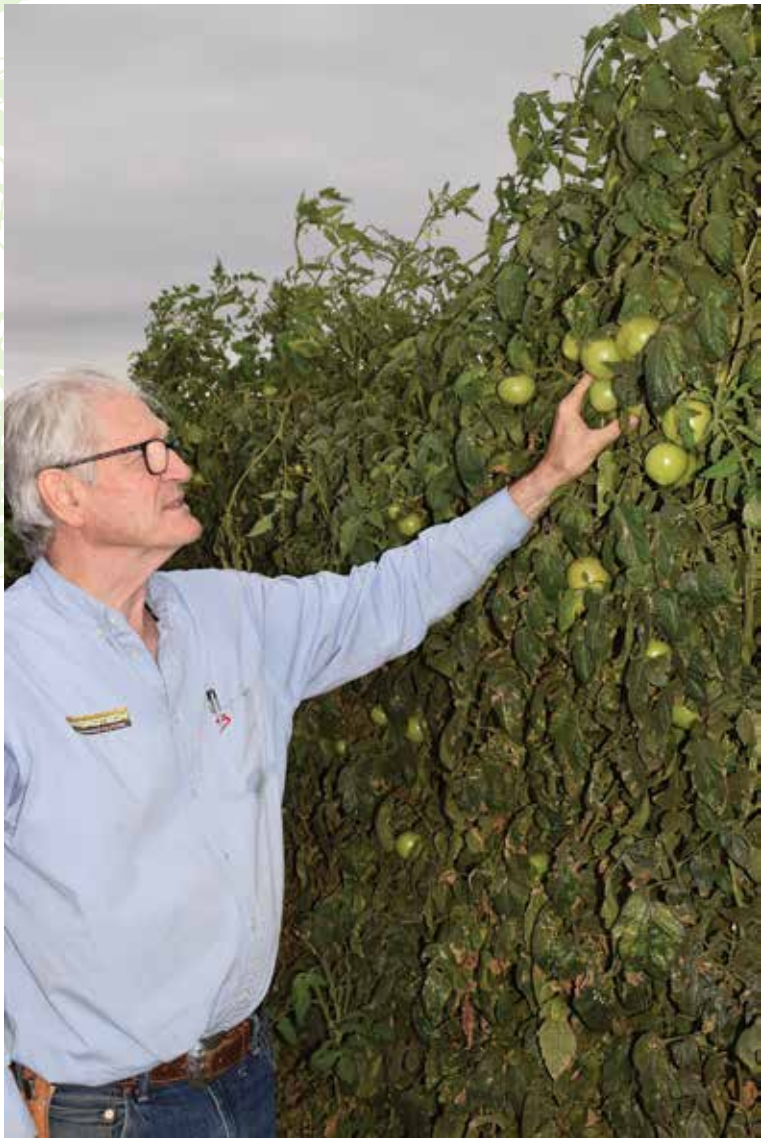
This time of year might leave you confused on which variety to choose. Rather than ending up with a variety that may not suit your tastes or needs, and to make your selection process easier, there are a few traits to keep in mind when choosing a tomato: plant habit, fruiting season, fruit shape and colour, use, and disease resistance are five main traits to consider.

Luckily Hygrotech is here to lend a helping hand. We have secured a unique variety that has taken all factors into consideration, and it is our great pleasure to introduce to you: **GOURMET EXTREME.**

This indeterminate flat round F1 hybrid tomato has quite a reputation.

It is suited for the fresh market due to the medium to large (180-220g) excellent quality fruit. The fruit is round, slightly flattened with smooth apple green shoulders. The thick walls, shallow gel locular cavities and the texture of the internal placenta contribute to the fruit's firmness and shelf life. The medium to large fruit make it suitable for unpruned open field production. However, pruning to the fork will result in more even sized fruit, throughout its growing season.

Unfortunately not everyone understands the difference in pruning under protection and pruning to the fork in open field. Traditionally growers will either prune to either single or double stem, removing most lateral side branches. Pruning to the fork entails removing leaves, lateral branches and crown fruit around the first fork about three weeks after transplant. This leaves the lower part of the plant exposed, free of leaves, branches and fruit. The result will be even sized fruit forming at the next cluster as seen in the figures below. It is extremely important to



treat the wounds with Sporekill or Coppercount N, to prevent infection of unwanted pathogens.

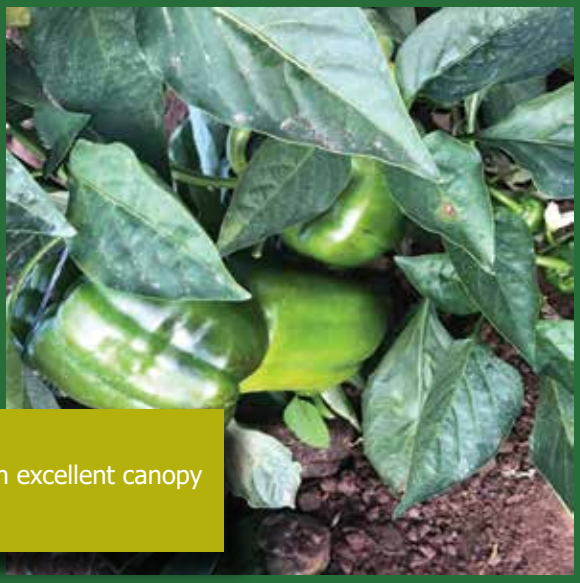
This variety has extreme vigour. Gourmet Extreme was planted 1st May 2018 in Komatipoort, on the 3rd of October 2018, 23 weeks later, the site was something to behold. Standing 2 m tall the fruit that developed on the top were still 120-150g. Habe Roode, 1.85m tall, was pleasantly surprised by the potential of this trending variety.

Commercial seeds of Gourmet Extreme will be available imminently.

Be sure to contact your closest representative. For more information on pruning to the fork feel free to contact your Hygrotech Technical Field Officer.

A STAR IS BORN...

RUBI STAR,THE PEPPER IN THE HYGROTECH STABLE IS SHINING BRIGHT AND TICKS ALL THE BOXES IN THE QUEST FOR A PEPPER WITH LONGEVITY.

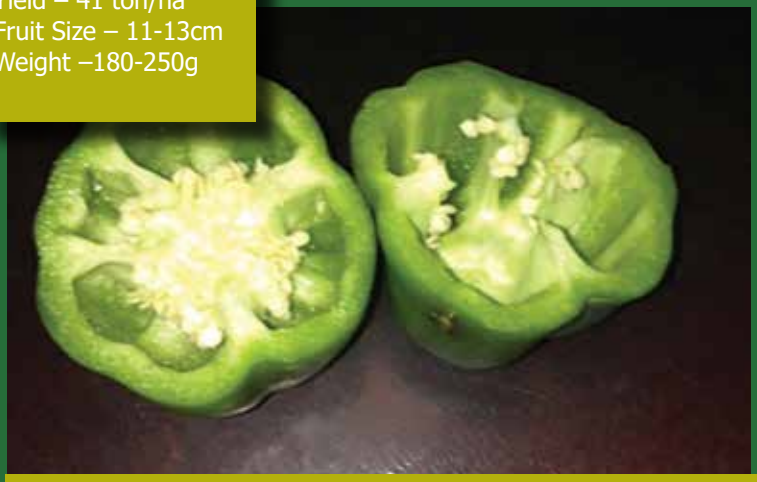


In the field:
Strong plant, with excellent canopy against sunburn

On the plant:
Great vigour and colour

In the box:
For maximum yield and excellent pack out.

Yield – 41 ton/ha
Fruit Size – 11-13cm
Weight –180-250g



Disease Package:
TSWV- Tomato Spotted Wilt Virus; XCV- Xanthomonas Campestris (BSt – Bacterial Spot) PVY- Potato Y Virus.

Steps to limit Sweet Pepper Post Harvest Soft Rot

Written by Michael Luttig: Area Marketing Manager – Nelspruit

Bacterial soft rot in sweet peppers is caused by *Erwinia* carotovora ssp. carotovora and when infected peppers arre left on the plant, affected fruit hang from the plant like a water-filled bag. Ripe and green fruit may be affected and causes financial losses. Fruit are affected very quickly, causing pepper tissue to lose its texture under high temperatures and humidity. In the last couple of years an increase in bacterial soft rot in sweet peppers fields were observed in the hot Komatipoort area during the rainy season.

Water quality: water quality has deteriorated in South Africa over time and because water is used as the main carrier for foliar and pesticide applications, this mode of use is also the means by which harmful pathogens enter the production areas, infesting crops. With a market shift to pre-pack peppers for some Komatipoort growers, rejection of peppers occurred this season when harvested during the hot season, each time after rain spells.

Even with good post-harvest practises, when apparently healthy peppers were harvested and put through the pack house, which included a dip bath with disinfectant, occasional market rejection occurred.

Symptom that caused market rejection:
Sweet peppers developed softening of the stem end of fruit from the cutting point (photo) and later secondary fungal growth appeared, resulting in rejections of the sweet peppers in pre-packaging on the market.

Identification of potential infection stages:

- Laboratory results confirmed the presence of *Erwinia* spp. within affected stem ends of the fruit.
- The *Erwinia* bacteria was present on the plants and established in the cup and fruit peduncle area of the pepper and multiplied during hot, humid days when raining.
- Therefore, infection potentially occurred when the *Erwinia* bacteria enteried the freshly cut wound during harvest by cutting tools, or contact of the stems with the walls of harvest crates.
- The disinfectant in the dip bath did not prevent the symptoms, as the bacteria entered the stem at the cutting wound, while a disinfectant only sterilized the surface of the pepper.

Photo 1. Collapsed sweet pepper infected by Bacterial Soft Rot.

Photo 2. Post-harvest bacterial soft rot at the stem end of sweet peppers followed by secondary fungal growth, resulting in rejections of sweet peppers in pre-packaging (Photo JW)

The following recommendations to eliminated rejections of pre-packed sweet pepper fruit at the market:

In the field:

- Select sweet pepper varieties with a shallow cup at the stem end where water can accumulate.
- Avoid excess nitrogen, excess irrigation, insect stings and other wounding.
- Remove partially decayed fruit from the field.

- Include **Sporekill** with every foliar spray: a full cover spray reduces risk of infection at the cutting point at the stem end.
- Increase cell wall strength of peppers with sufficient calcium by spraying **Calmabon.**
- Reduce plant stress by applying **Asco-Gro** through the drip and **Grotonic** as foliar spray.
- Ensure full cover sprays by reducing drift by using **Mist-Control.**
- Use **Nufilm P** as sticker with foliar sprays, products applied will be rain fast up to 25mm rain.

At harvest:

- Train workers to regularly sterilize cutting tools.
- Clean and sterilize harvesting crates before harvest daily, as this was identified as a source of infection at the fresh cutting wound at the stem end of peppers when in contact with dirty, contaminated crate walls.

Post harvest:

- Use a dip bath with a registered agricultural disinfectant and replenish often.
- Remove free water from fruit by a combination of an efficient air dryer after the dip bath and allow enough time for cooling of the peppers before storage, pre-packing or shipping to the market.

Compendium of Pepper Diseases, 2003: Edited by K.L. Pernezny, P.D. Roberts, J.F. Murphy, and N.P. Goldberg
https://ag.umass.edu>fact-sheets>pepper-Soft-Rot

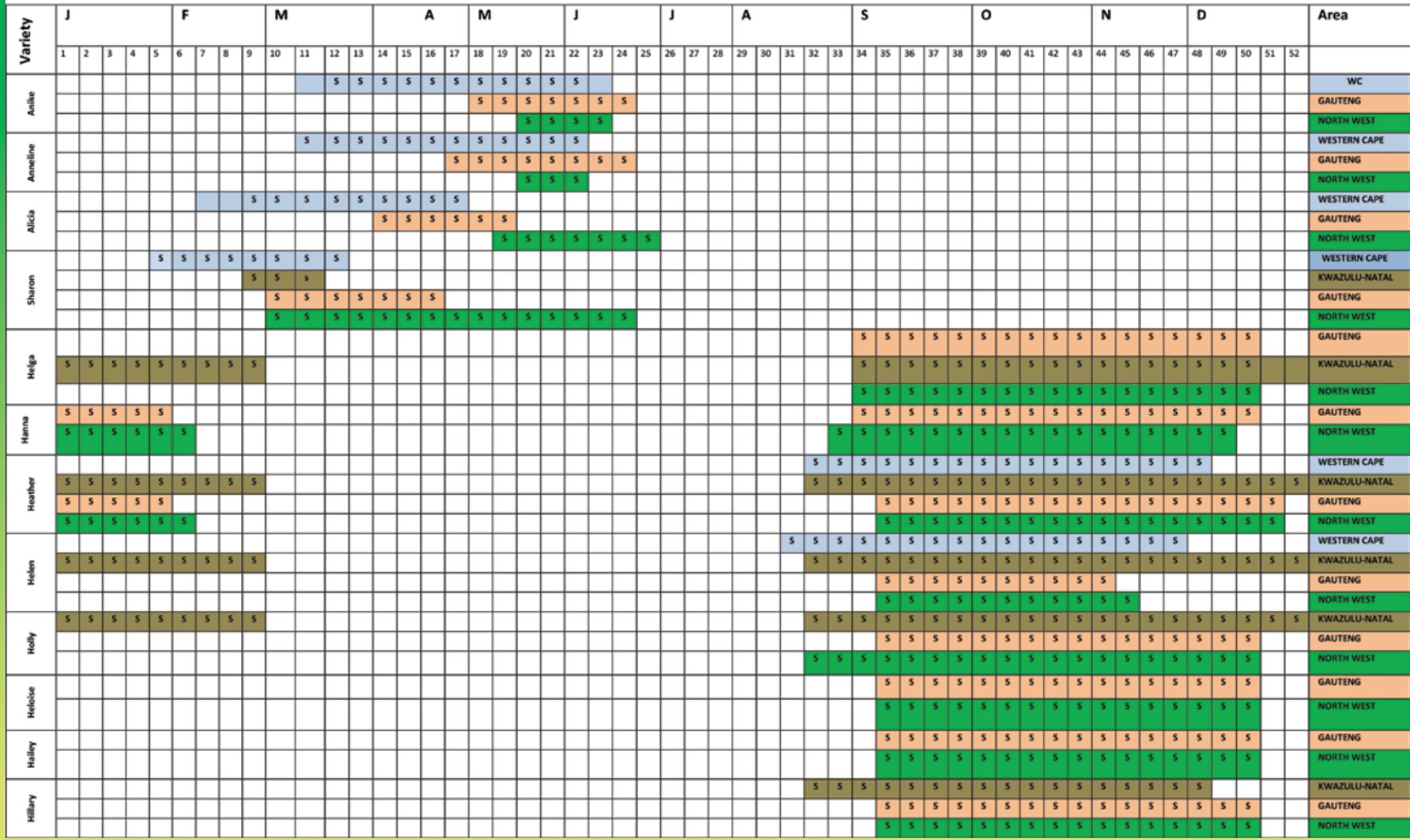
HYGROTECH RANGE OF CRISPHEAD LETTUCE

Written by Dr Martin Maboko - Group National Horticulturist

New varieties have been evaluated in different regions of different climatic conditions of South Africa, such as, Western Cape, KwaZulu-Natal, North West and Gauteng province in 2017/18.

Preliminary results of new crisphead lettuce varieties have been well received by the sector and are proving to be reliable, high yielding with good quality parameters of large frame size, compact head, flat base, shorter internal stem, good internal quality and no ribbing problem. Varieties showed great uniformity among the standard cultivars which will advantageously ensure a high percentage of harvest for the first cut. Preliminary planting slots for crisphead lettuce varieties in different regions are shown in a table below. Lettuce growers are advised to contact their nearest Hygrotech branch for a plant slot of their area.

PRELIMINARY PLANTING SLOTS OF CHRISPHEAD LETTUCE VARIETIES



New range of available

Fancy lettuce cultivars

Written by Dr Martin Maboko - Group National Horticulturist

Lettuce is one of the most consumed fresh leafy vegetables across the world in salad mixes as well as in sandwich fillings. Hygrotech constantly searches for new material for the needs of the customer, whether they be for romaine, oakleaf, gem lettuce, midi-cos, Lollo or butter lettuce for processing or fresh purpose or pillow pack for open-field and protected growing conditions. Hygrotech has identified new varieties in different climatic conditions and areas for their client.

Table 1. Fancy lettuce varieties

Type	Cultivar	Description	Disease package
MULTILEAF	Rubygo	Multileaf red Batavia type variety. Plant with a nice colour contrast, strong leaves with good holding ability and good shelf-life. A unique square leaf, ideal for sandwich garnishing.	B: 16-28, 30-32, Nr: 0 LMV: 1
RED OAK LEAF	Eluarde	Deep red colour, well indented soft leaves. A compact, but well closed head which is easier to harvest. Green base with deep red colour on the upper part of the leaf.	BI: 16-25, 27, 28, 30-32, Nr:0
	Camarde	Red oakleaf lettuce producing an intense, uniform red colour throughout the season. Vigorous plant with dense heart. Green base with deep red colour on the upper part of the leaf.	BI: 16-32, Nr:0 LMV:1
GREEN OAK LEAF	Panisse	Light green, compact oakleaf lettuce. A medium sized plant with a dense heart, and good standing ability. Smooth, lobed glossy leaves.	BI: 16-32, Nr:0 LMV:1
	Rodanice	Light green, compact oakleaf lettuce. A medium sized plant with a dense heart, and good standing ability. Smooth, lobed glossy and soft tender leaves.	BI: 16-28, 30-32, Nr:0 LMV:1
	Berenice	Traditional oakleaf type, with long lanceolate leaves of bright green colour. Versatile variety with good tolerance to bolting.	LMV:1
LOLLO	Javelo	Lollo Bionda type, light green in colour. Attractive, well-balanced and compact plant. Very good holding ability.	BI: 16-32, Nr:0
	Anselo	Is a Triple-red lollo, well-coloured on the entire foliage including the heart. Good volume	BI: 16-28, 30-32, Nr:0
	Matelo	Matelo is double red Lolla Rossa type. Well coloured leaves. Good vigour and growth in cold conditions.	BI: 16-28, 30-32, Nr:0
BUTTERHEAD	Pomery	Variety with a large voluminous head producing a good rate of usable leaves. Well suited for the processing industry. Good field standing ability.	BI: 16-32, Nr:0 LMV:1
	Vilandry	Variety with a nice and well closed heart. Suitable for both processing industry and fresh market. Clean, healthy and well closed base.	BI: 16-32, Nr:0 LMV:1
RED LITTLE GEM	Pigale	Very attractive red lettuce. Excellent Bremia resistance. Good resistance to bolting and tipburn. Compact and grow upright. Good uniformity and holding ability.	BI: 16-28, 30-32, Nr:0
	Rivale	Rougette type. Attractive red outer leaves. A very neat gem heart with a short core.	BI: 16-26, 28,32 Nr:0 LMV:1

GREEN LITTLE GEM	Electra	Is a little gem with a good tolerance to tipburn and bolting. Voluminous plant, easy to trim for gem hearts production. Wide harvest season depending on the cultivation area.	BI: 16-32; Nr:0 LMV:1
	Senna	Is a light-green semi-savoyed outer leaves which contrast well with the yellow hearts. A reliable, slower maturing variety with good bolting tolerance.	BI: 16-32; Nr:0 LMV:1
COS – BLOND (Open type)	Donador	Smooth and bright leaf. Plant easy to handle. Rounded and tightly closed base. High tolerant to tipburn and bolting.	BI: 16-27, 29, 30, 32 LMV: 1, Fol: 1
	Lucior	Cos lettuce with a light green blistered foliage. Complete resistance to Bremia races and aphids.	BI: 16-32, Nr:0, Fol: 1
COS –GREEN	M961	Is a compact plant of medium plant height of 28 cm with a very well-shaped and heart conformation. Sweet taste	BI: 16-32, 34
	M956 (Pytagor)	Dark green, compact plant of 28 cm plant height with a very well-shaped and closed head. Sweet taste.	LMV:1
	Dulicita	Well balanced Iceberg Cos cross type variety of medium green clour. Good weight gain in cold conditions and tolerant to warmer temperatures. Very sweet and crunchy in taste.	Bl: 16-30, 32

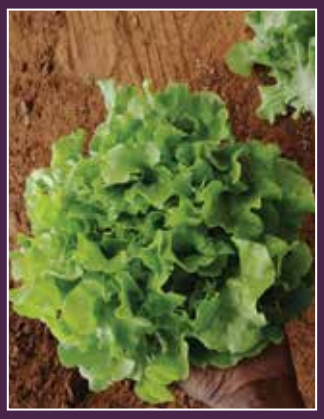
Abbreviations:
BI: Bremia lactucae or mildew
Nr: Aphid Nasonovia ribisnigri
LMV: Lettuce Mosaic Virus
Fol: Fusariosi vascolare, Fusarium oxysporum f.sp. lactucae

RED OAK LEAF

ELUARDE

CAMARDE

GREEN OAK LEAF



PANNISE

RODANICE

BERENICE

MULTILEAF

RUBYGO

LOLLO

JAVELO

ANSELO

MATELO

RED LITTLE GEM

PIGALE

RIVALE

GREEN LITTLE GEM

ELECTRA

SENNA

BUTTERHEAD

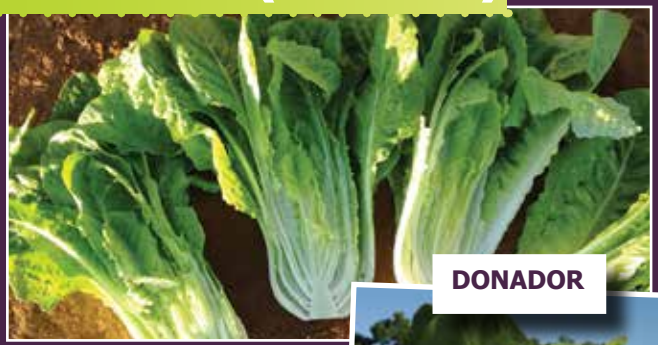
POMERY

VILANDRY

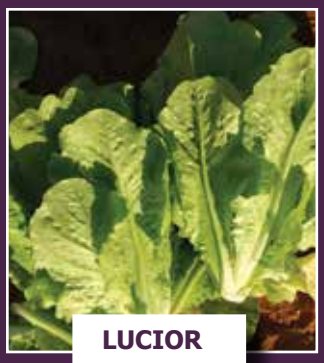
RED MINI COS

N585

COS - BLOND (OPEN TYPE)



DONADOR



LUCIOR

COS - GREEN

M961

M956 (PYTAGOR)

Water-Melon Temptation

Hygrotech has conducted screening and semi-commercial trials over the past few years on F1 All Sweet type water-melons in the Bushveld area from a new, prominent cucurbit breeding company in the USA. The latest trials were planted in mid-July at Tom Burke on the farm Klipbank of Johnnie Müller.

A selection of new All Sweet hybrid varieties, **HTW 1811** and **HTW 1830**, have shown vigorous growth with strong vines and excellent fruit set and yielding. Very large uniform fruit between 12 -18 kg were produced with deep red flesh and a high brix of 12 % was measured. Johnnie's first remark as we evaluated the fruit was " super soet !" These new All Sweet hybrids had excellent leaf coverage and shown good heat tolerance during a heat spell. They also had excellent tolerance against Fusarium (Fom) 1 and 2 and Anthracnose (Co) over a period of 80-90 days.

Hygrotech still needs to do a series of final evaluations before the next water-melon season.
More information on these big and exiting new water-melons, will be circulated during Feb / March 2019 in order to continue with semi-commercial plantings when the water-melon season starts in April / May 2019.

Charl Kotze

CONTACT DETAILS

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013 753 3774

Nelspruit
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7 SUIKERRIETSTREET,
INDUSTRIAL AREA,
NELSPRUIT, 1201

The Hygrotech Family would like to introduce

Charl Kotze

as our

TECHNICAL MARKETING MANAGER: FERTACHEM – NORTHERN REGION

Charl Kotze has been appointed at Hygrotech as from October 1st 2018.

After school Charl attended the University of Stellenbosch and obtained the following degrees:

- B.Sc. Agric: Plant pathology and viticulture
- M.Sc Plant pathology (biological control of grape-vine disease pathogens: pruning wound protection)

Charl has been employed by Citrus Research International (CRI) in Mbombela for 11 years. His experience includes Citrus Black Spot, Alternaria Brown Spot, soil borne diseases, integrated disease control, as well as fruit fly and nematode research.

Since 2016, Charl worked as the head researcher responsible for development of disease control programmes on fruit- and leaf diseases (citrus) in South Africa. Charl presented numerous scientific papers at international simposia and workshops and has also been the author and co-author of numerous published scientific articles.

Charl is based in Mbombela (Nelspruit) and is responsible for technical marketing and support of the Hygrotech chemical product range to several distributors. He will be working closely with the Hygrotech Area Managers in the northern region. As a priority, Charl will also be fully involved with the Miller Chemical product range.

We welcome Charl to the Hygrotech stable and wish him all of the best with his very important task !

Taco-Stuffed Peppers

Ingredients

6-8 Medium/Large Bell Peppers – ensure they have a flat base so they will stand up when cooking
1 lb Ground Beef
1 Medium Yellow Onion – Diced
1 Can Black Beans – Drained
1 Cup Cooked Brown Rice
1 Cup Frozen Corn
1 Jar Medium Chunky Salsa
1 Packet (about 2 Tbsp.) of Taco Seasoning Mix*
1 1/2 – 2 Cups Grated Cheddar/ Mexican Blend Cheese
Optional: Guacamole and Sour Cream to finish
***To make your own Taco Seasoning at home: (note: makes more than needed for this recipe)**
1 Tbsp. Chili Powder
1 1/2 tsp Ground Cumin
1 tsp Salt
1 tsp Black Pepper
1 tsp Corn Starch
1/2 tsp Paprika
1/2 tsp Garlic Powder
1/2 tsp Onion Powder
1/4 tsp Cayenne Pepper
1/4 tsp Oregano

Directions

Cut off the top and remove the seeds from each pepper. Place in a baking dish and bake for 20 minutes in a preheated oven at 350F (175C). While the Peppers are roasting – heat oil in a large skillet over medium/high heat. Add ground beef and season with entire taco seasoning packet.

Allow beef to brown on all sides. Add diced onion – continuing to cook until softened. Reduce heat to Medium. Mix in the black beans, brown rice, corn, and salsa. Add in 1 cup of cheese and stir until incorporated and the cheese has melted. Remove from heat.

Remove peppers from oven and fill each with the taco mixture. Top with additional cheese and return to the oven for 15 minutes until the cheese has melted. Top each pepper with a generous scoop of guacamole and sour cream.

HYGROTECH
SUSTAINABLE SOLUTIONS

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