the FORUM

Since 1991

Vol.2
2019

INSIDE: Vegetable cultivars | Agri-Chemicals and fertilizers | Forage and pasture | Miscellaneous

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from the
EDITOR'S PEN

Let it be...

Sometimes good things happen to people when they least expect it. Close friends of me and my wife experienced 'the unexpected' many years ago. This couple battled to have a child of their own and numerous doctor's appointments, tests, infertility procedures, temperature measurements, traveling, lots of money and tons of hope, came to nothing during an 8 year period. It must be said that the couple also diligently played their part, especially the more than willing husband…. and some hilariously funny incidents, best left alone, were part of the whole saga. Suffice to say that to this day, the husband still experiences a quivering feeling when an alarm clock goes off close to him….

An unavoidable point was reached where these friends had to make peace with the reality that they won't have a baby of their own. Female emotions are way more intricate than those of a man and the poor wife had an extremely difficult time to accept the inevitable, but eventually the couple went on with their lives, fairly intact.

A good holiday and change of scenery also played its part to calm down the accumulated stress and heart ache. Six months later the wife fell pregnant (without medical intervention and pills) and a healthy, beautiful baby girl was eventually born. Two years down the line another child, this time a sizable baby boy, came into the world. The first-born, now a young woman, just completed her studies and will start her legal career at a law firm early in January.

Why am I sharing these rather personal and intimate details of this couple with you? Because life might still have unexpected twists and turns for you and me. Occasionally you have to take a back seat, in a manner of speaking. **Just let life be…. and let God be.**

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VEGETABLE PRODUCTION

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FORAGE & PASTURE

MISCELLANEOUS

ON THE COVER: Blue berries - a fast growing agricultural sector. See page 44

The making of a new fresh "processing" tomato concept

By Habe Roode: Hygrotech Consultant

The diversity of processing tomatoes that end up in tomato sauce, juice, whole peel, paste, in baked beans, soups, pasta sauces, pizza baste, sun dried and lycopene medication to increase antioxidant activity is well known worldwide- see lycopene article on pages 12 and 13 of the Hygrotech Forum Volume 1. 2019.

As of lately, but with slow progress, unique traits have been introduced in tomato breeding resulting in seedless tomatoes -to prevent Diverticulitis in Human Beings-and All Flesh tomatoes- no jelly in the tight seed locules of the fruit.

Figure 1: *All flesh tomato*

It is common knowledge that millions of slices of tomatoes are being used daily on hamburgers world wide and in South Africa, but with the irritating phenomena of either one or two small slices that pop out of the other side of the burger after taking the first bite, or the jelly in the locules of the tomato slice simply falling out when building the burger eating at a restaurant or at home, leaving a tasteless "skeleton" slice of tomato.

The concept of All Flesh tomatoes are multi- and tight locules with a few seeds and almost no jelly that will produce a tasty, firm slice of tomato that will complete the perfect hamburger.

The new generation F1 hybrid All Flesh tomatoes are vigorous, large and deep fruited that will provide 8-10 slices of 8-9 cm in diameter for your scrumptious hamburger! The new All Flesh tomato material have excellent disease resistance packages on vigorous determinate or indeterminate plant types - the latter for plastic tunnels and green houses where the plants could be pruned to double stems to maintain large, globe shaped fruit- bearing firm, high colour, deep round fruit.

There are also All Flesh roma-processing type fruit that can be used in salads, on pizzas, canned whole peeled or diced, sauces and juices on mostly determinate plant types. Seeds for trial or semi- commercial purposes will be made available in the near future and will also feature strongly in our upcoming summer trials at Hygrotech's trial grounds at Dewagensdrif- north of Pretoria- and in Stellenbosch.

Please contact your nearest Hygrotech sales representative for more information and a few trial seeds.

Figure 2: *Regular tomato, with large jelly locules vs All-Flesh tomato with small jelly locules*

THE HIGH FLYER.....

HY-GREEN

Compiled by Herman de Beer – Area Marketing Manager, Bushveld, Limpopo

HY-GREEN baby marrow is taking the market by storm because of specific characteristics, which suits the farmer. **HY-GREEN** has a very high yielding potential under extreme high temperatures and reaches maturity within 45 to 50 days.

HY-GREEN has a strong growth habit and very good disease resistance late in the season.

HY-GREEN has small blossoms which assist in easy removing. **HY-GREEN** has a longer stem that makes picking easier.

In the Waterpoort area **HY-GREEN** produced 25-26 tons fruit per ha.

HY-GREEN is therefore a farmers friend and is preferred by packers because of its quality, shape and dark green colour. The shape of the fruit is cylindrical with lengths of 7-14 cm and a diameter of 3,4 cm.

The disease resistance package includes Zucchini Yellow Mosaic Virus, intermediate resistance against Zucchini Mosaic Virus, Watermelon Virus and Powdery Mildew.

Farmers are reminded to include **HY-GREEN** in the planting programme.

Buttery flesh and nutty flavour called Butternut

By Christo le Grange: National Product Development Manager

The butternut squash is a type of squash with a sweet taste. All the seeds and membranes are found in the round part of the butternut and are therefore easy to remove. The name 'butternut' comes from its buttery flesh and nutty flavour.

While the butternut is used for many food purposes, it is also one of the most grown squashes in South Africa. Hygrotech & Seedcor ranges are getting bigger and stronger to meet all the farmer requirements. The following cultivars will be suitable for the Central & Northern region of South Africa and in this article we will focus more on the Seedcor range.

HSC 173 F1 (Seedcor) jumped onto the market with a large portion of growers looking for a small to medium sized option. This cultivar will give you goose pimples by seeing the high yield and good uniformity. The ideal size is 900g to1,2kg and HSC 173 F1 will not disappoint any grower looking for smaller fruits.

METRO F1 - the next option with slightly bigger fruit than **HSC 173 F1**. This cultivar has excellent yield potential and quality fruit. Fruit sizes of 1,1 – 1,4kg will make up the bulk of the yield.

PRISM is the new butternut variety for the export market and supermarkets. The fruit size and shape are very uniform with deep orange flesh colour. The size varies from 1.4kg to 1.8kg and the seed cavity is very small. We are doing several semi-commercial trials this year in the Western Cape to see if it's quality is suited for the export market.

"The name **'butternut'** comes from its buttery flesh and nutty flavour"

PILGRIM F1 (Seedcor) has the more the "old fashion" fruit shape with similar fruit sizes than **Metro F1.** Pilgrim has fruit weights of between 900g – 1,2kg and prefers to be grown into winter. Very quick with a massive yield potential.

CRUSADER F1 is one of the new kids on the block and Seedcor is proud to offer this line to the farmer. Excellent leave cover and a strong plant make this cultivar a good option for any grower. Fruit weight varies between 1,8 – 2.5kg. Fruit is more "cylindrical" and the rather fuller neck gives the impression of being almost cylindrical. A lot of flesh and excellent pack-out will please any grower.

HSC 155 F1 (Seedcor) is the big brother of **HSC 173 F1**. This cultivar will lean more towards the **Crusader F1** sizes, but could reach up to 2,3kg. If you want to fill up bags quickly or sell to the loose fresh market, **HSC 155 F1** will be the option.

Include some of the Seedcor butternuts in your next planting.

GREEN BEANS FOR AFRICA – and the rest of the world!

By Habe Roode: Hygrotech Consultant

Hygrotech's green beans programme has grown in heaps and bounds resulting in tremendous market acceptance world-wide of practically every type of bush and runner beans that include the very diverse market of garden-processing (freezing and canning) pre-pack – fresh export and speciality beans. They come in old style garden beans, bobby, fine and extra fine in sizes from 20cm in length and 1.2cm in diameter down to 12cm in length and 0.55cm in diameter.

Pod features have developed from skinny light green to mat dark green pods. One will hardly find a bean variety that is not completely string less, has slow seed development and more and more easy/clean pick attributes for modern harvesting.

In countries where hand labour are still used such as Sub-Saharan Africa, Mexico, Central and South America, a variety such as **TAHOE** has become very popular and sought after by small scale and subsistence farmers with **ENCLAVE** and **ESCAPE** the back-up plan. Together with **GOAL** they provide a very adaptable range of material for the export markets into the UK and pre-packed on punnets. An extra-fine black seeded variety **ROMEO** has just been released with a high anthocyanin content that provide a flavour and taste the French just love to eat with their "bleau" steak, mash potatoes and gravy.

ENVOY beans are suitable for machine harvesting for the freezer market with exceptional yields – up to 55 even sized pods per plant. Hygrotech's two unique pole bean varieties, **CASABLANCA** and **DAKAR** are gaining popularity for slotting as a crop rotation option in plastic tunnels and green houses. **DAKAR** is now being produced in Europe, Morocco, Brazil, Mexico and other Central American countries.

Contact your local Hygrotech branch and sales representative for tech sheets and more information on the company's unique and very diverse IP green bean material.

TAHOE

Suitability: Fresh market
Days to maturity: 62 days
Plant height: 40 - 50 cm
Pod length: 13 - 15 cm
Pod diameter: 8 - 9.5 mm

- Attractive straight, dark green pods
- Concentrated pod set
- Upright growth habit
- Good leaf cover and heat tolerance
- Medium to dark green plant
- Smooth, shiny pods

Disease Resistance
Bean Common Mosaic Virus, Intermediate resistance to rust

ENCLAVE

Grading: 6.5 - 7.5
Pod lenth (cm): 14
Pod colour: Shiny dark green
Plant height: 40-50

- Good quality export bean suitable for pre packing into super markets and fine beans

Disease Resistance
BCMV = Bean Common Mosaic Virus,
Ua = Rust (Uromyces appendiculatus)
(IR = Intermediate Resistance)

ESCAPE

Suitability: Pre-Pack & Fresh market
Days to maturity: 60 days
Plant height:45 cm
Pod length:14 - 15 cm
Pod diameter: 7 - 8.5 mm

Disease Resistance
HR: Bean Common Mosaic Virus.
IR: Rust

- Upright growth habit with good medium to dark foliage.
- Produces a very good yield that is fairly concentrated.
- The pods are round in cross section and straight, with a smooth texture and shiny appearance.
- Good heat tolerance.

ROMEO

Pod Qualities: 90% < 6mm
Pod Diameter: 10% < 6.5mm
Pod length: 10 - 12cm
Colour: Medium dull green
Plant type: Straight upright bush bean plant
Seed colour: Black

Disease Package:
Bean Common Mozaic virus and very tolerant towards Common Brown Rust and Anthracnose.

- Romeo is a stringless “Mangetoute” high quality tasting, extra fine French type bean
- It has a very good yield potential
- Comparing well to other bigger podded fine bush beans

CASABLANCA

Suitability: Fresh market, pre-pack & export
Type: Runner bean
Days To Maturity: 55-60 days from sowing
Plant Type: Robust
Pod Colour: Shiny, medium-green
Pod Shape: Fine, straight pods
Pod Length: 15-17 cm
Pod Diameter: 8-9 mm
Plant Population: 60 000-70 000 plants/ha
Season: Summer & frost-free areas

Disease Package:
HR: Bean Common Mosaic Virus

- Good shelf life
- Concentrated pod set
- Excellent yield potential
- High pack out
- Transports well

DAKAR

Suitability: Fresh market, pre-pack & export
Type: Runner bean
Days To Maturity: 55-60 days from sowing
Plant Type: Robust
Pod Colour: Shiny, medium-green
Pod Shape: Fine, straight pods
Pod Length: 15-17 cm
Pod Diameter: 8-9 mm
Plant Population: 60 000-70 000 plants/ha
Season: Summer & frost-free areas

Disease Package:
HR: Bean Common Mosaic Virus

- Good shelf life, Concentrated pod set, Excellent yield potential, High pack out, Transports well

GOAL

Suitability: Pre-pack & Fresh market
Days To Maturity: 60 days
Plant Height: 50 cm
Pod Length: 11-12 cm
Pod Diameter: 6-7 mm

Disease Package:
HR: Bean Common Mosaic Virus, IR: Rust

- Fine bean most suitable for hand picking over a longer period.
- Strong plants
- Long flowering period
- Dark green pod colour
- Anthracnose tolerant

Young farmer of the year

During the recent TLU-SA congress, Henna du Plessis walked away with the honour for being chosen as the 'young farmer of the year'.

Henna farms in the Maasstroom area and his extensive farming operation includes amongst others, the production of sweet peppers, onions and butternuts.

Hygrotech is proud to be associated with Henna and the following of our products are planted on his farm: **peppers Rubistar F1 and Floyd F1, as well as butternut TNT F1.**

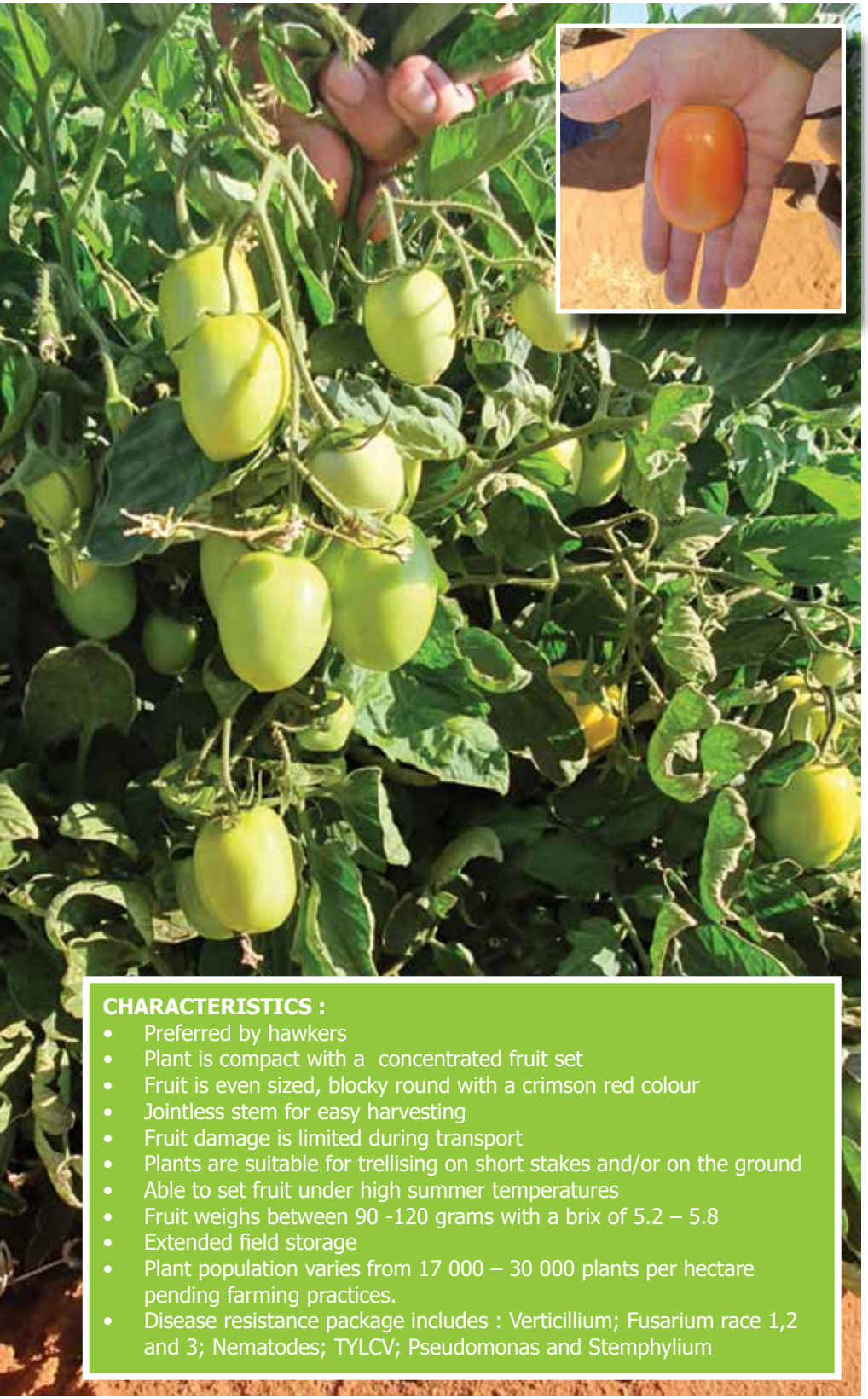
Well done and congratulations Henna!
May your future be even more successful.

Peppers Rubistar F1 and Floyd F1

TOMATO HTP 328

Compiled by Herman de Beer – Area Marketing Manager, Bushveld, Limpopo

Tomato HTP 328 is a determinate processing and fresh market tomato.... set to hit the market with a bang !



CHARACTERISTICS :

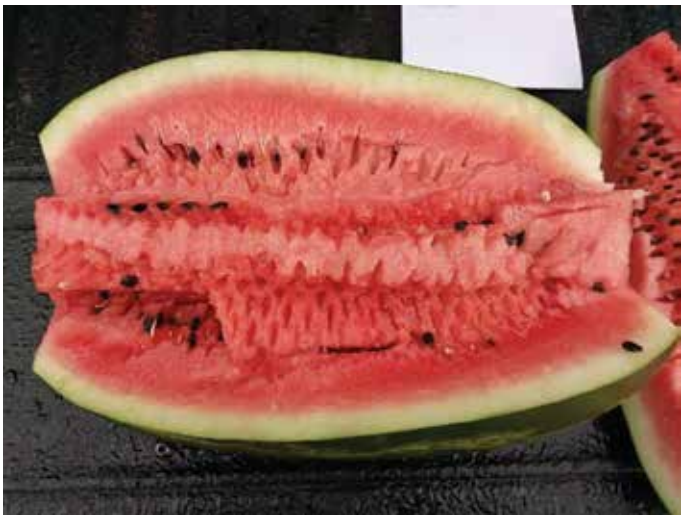
- Preferred by hawkers
- Plant is compact with a concentrated fruit set
- Fruit is even sized, blocky round with a crimson red colour
- Jointless stem for easy harvesting
- Fruit damage is limited during transport
- Plants are suitable for trellising on short stakes and/or on the ground
- Able to set fruit under high summer temperatures
- Fruit weighs between 90 -120 grams with a brix of 5.2 – 5.8
- Extended field storage
- Plant population varies from 17 000 – 30 000 plants per hectare pending farming practices.
- Disease resistance package includes : Verticillium; Fusarium race 1,2 and 3; Nematodes; TYLCV; Pseudomonas and Stemphylium

Contact your nearest Hygrotech branch for more information or to find out about seed availability.

Sweet All Sweet

In one off our earlier Forums (Volume 2 – 2018), we featured new watermelon cultivars coming down the develpment line. With Central and Limpopo growers preferring All Sweet types, weare proud to introduce **Hurricane F1** (HTW 1830). Vigorous growth and excellent fruit set that will lead to exceptional yields and uniform large fruit reaching weights between 12 – 15kg were measured during all our final trials. Super sweet flavour with brix levels between 11 – 14%.

Hurricane F1 will offer the following to the grower: 12 – 15kg fruit, excellent leaf cover during the hot spells associated with the northern heat, disease tolerance against Fusarium (Fom) 1 & 2 and Anthracnose and maturity over a period of 90 – 100 days.



The **importance** of a balanced fertilization programme on **MELONS**

Written by Hugo Burger – Technical Manager: Stellenbosch branch

Fertilization in the production of melons is critical and must be done correctly. It is difficult though, due to the many variables like soil type, climatic conditions and irrigation schedules. But there are basic fertilization directives which should be followed to achieve good yields with quality fruit. The specific cultivar also plays a role as all cultivars have different growth periods which should be taken into consideration with fertilization schedules.

Elements which play the most important role during the growing phase of a melon plant are Nitrogen (N); Phosphate (P); Potassium (K); Calcium (Ca); Magnesium (Mg) and trace elements like Boron and Molybdenim. Carbon levels (1%) in the soil also plays a significant role because it determines the release and absorption of Nitrogen. The soil acidity level i.e. Ph, should also be within certain norms (5.5 – 6.5) for good absorption.

It is important that Potassium, Magnesium and Calcium should be in the correct relation. The relation of Mg to Ca should be 1 : 3-5. Ca + Mg to K should be 10 and 15. Both Ca and Mg are antagonistic to K and in soil where Ca and Mg are high, it can influence the absorption of K negatively. The absorption of K is also determined by the quantity of P in the soil. If the P is 30 – 50 parts in the soil, at least 300 kg / ha K should be applied.

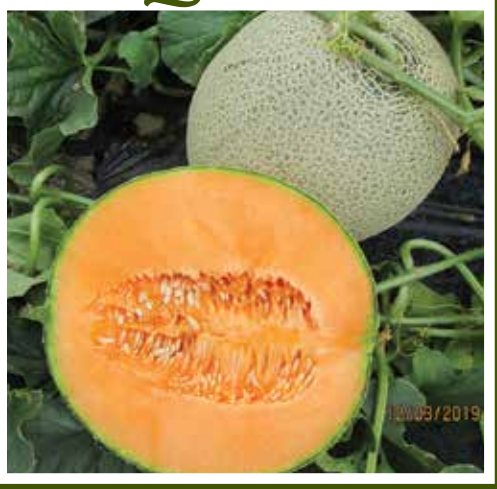
Many producers confuse Ca deficiencies with Mg and K deficiencies. In many cases there are too little Mg in the soil and too much Ca. The plant will then show a Ca deficiency because it can't be taken up. More Ca is then wrongly applied which aggravates the problem. Extra Mg should have been applied to correct the relation between these two elements which would have resulted in the re-absorption of Ca. Soils in Namibia are naturally very high in Ca and in many cases it would therefore not be necessary to apply any Ca at all (only extra Mg and K).

The following fertilization needs are essential for melons :
N: 160 kg / ha
P : 60 – 100 kg / ha
K : 250 – 300 kg / ha
Ca : 120 – 150 kg / ha
Mg : 30 – 40 kg / ha

To ensure good vegetative growth with fruit set, these elements should be applied sensibly to have the best yields for the farmer and quality fruit for the end-user.

Amazing Melons

Avenger



Disease Resistance: Fusarium 0,1 & 2
Powdery Mildew 1 & 2

- **Type:** Harper melon
- **Maturity :** 80 – 90 days
- **Fruit shape:** Round / Oblong
- **Fruit size:** 2,2 – 2,9kg
- **Internal Colour:** Deep orange
- **Plant size:** Good vigour

Hunter

Disease Resistance: Fusarium 0,1 & 2
Powdery Mildew 1 & 2

- **Type:** Harper melon
- **Maturity:** 80 – 90 days
- **Fruit shape:** Round /Oblong
- **Fruit size:** 2.5kg
- **Internal Colour:** Deep orange
- **Plant size:** Good vigour

WOODLAND'S NEW VEGETABLE SEED HUB

By Habe Roode: Hygrotech Consultant

Hygrotech was privileged to attend the inaugural USA Vegetable Field Days from 13 -18 August 2019 on the trial site of Tyson Schmidt which hosted Lark Seeds Int including Admiral and Colorado Seeds, Bonanza Seeds, Western Pacific Seeds, Pureline Seeds, Weststar Seeds, Origene Seeds and Rupp Seeds.

A number of multi-national vegetable seed companies that have been in the Woodland area, namely Seminis/ Monsanto/ BASF and Syngenta for a long time and as of lately Sakata, Hazera and PanAmerican Seeds, have all had numbers of visitors during, before and after the official trial week.

"AS COLOURFUL AS VEGETABLES CAN BE"

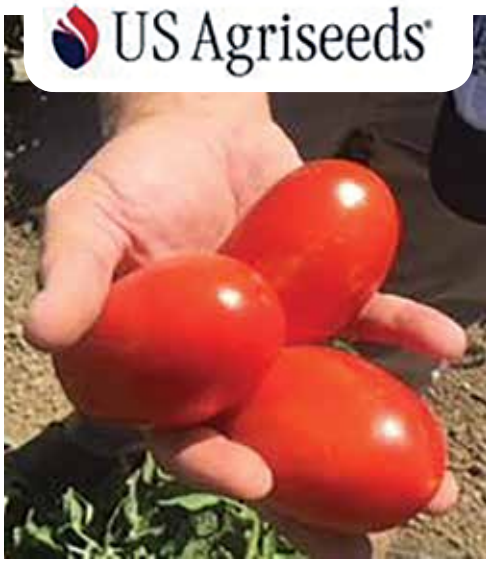
Jacob Frose and Hygrotech's CEO, Henry van Der Voort with exceptional watermelons.

One of Jacob's very unique small seed cavity Harper Melons.

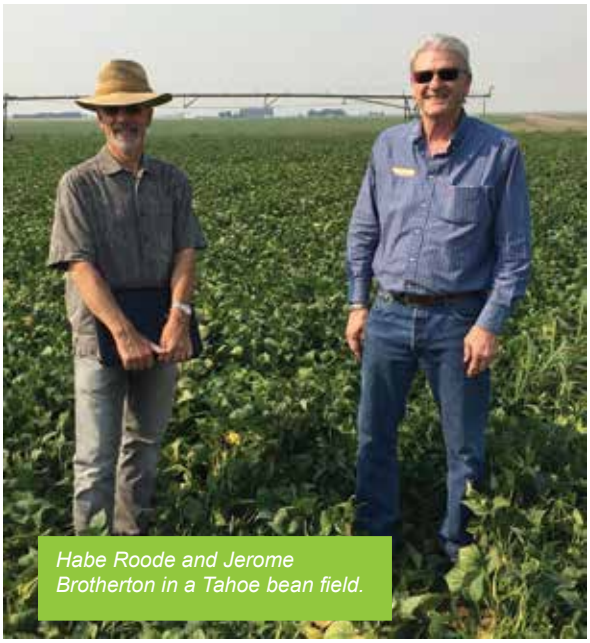
A Colorado Seeds winner, attractive dark green Zucchini squash.

New Zucchini Squash USAS 9925 from USAgri Seeds

New release Harper type melon with impressive disease resistance package



Determinate Saladette with full-house disease resistance package



Habe Roode and Jerome Brotherton in a Tahoe bean field.

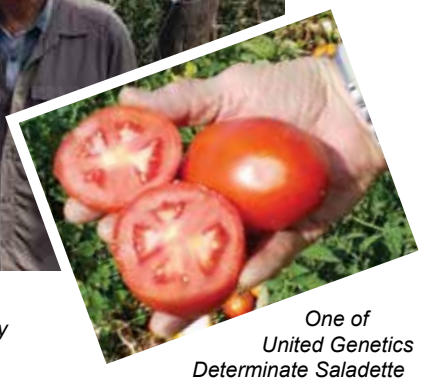
Habe Roode and Kenny Calhoun from TS &L in a processing pepper field.

"Seedsmen don't grow old, they just lose their germination"

- Habe Roode

United Genetics ventured into Greenhouse varieties with this unique large fruited Indeterminate Saladette

Long time friends in the vegetable seed industry. From left to right Habe Roode, Bob Heise (recently retired Breeder) and Pat Boeleda from United Genetics



One of United Genetics Determinate Saladette with with a full-house disease resistance package

OAKLEAF LETTUCE

By Dr Martin Maboko - Group National Horticulturist

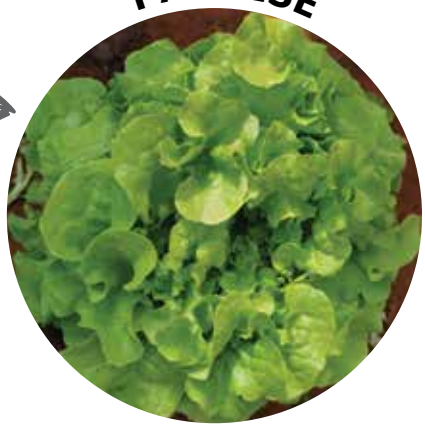
Lettuce has caught the vegetable growers attention since it has become increasingly popular as a vegetable in salads. Hygrotech has the whole spectrum of lettuce i.e. Oakleaf, Cos, Butter, Batavia, Lollo Rossas and Lollo Bionadas lettuce with the ideal contrasting colours for pillow pack mixes and whole head production. Hygrotech continuously conduct cultivar trials to ensure the growers maintain good quality products throughout the season. Below are some of Hygrotech's Red and Green Oakleaf lettuce varieties that were evaluated in field and hydroponic systems with good quality and disease package.

CAMRADE

Red oakleaf lettuce producing an intense, uniform red colour throughout the season.

Disease package: BI:16-32; Nr:0; LMV: 1

PANNISE



Light green, compact oakleaf lettuce. A medium sized plant with a dense heart, and good standing ability. Smooth, lobed glossy leaves.

Disease package: BI: 16-32, Nr:0, LMV:1

ELUARDE

Deep red colour, well indented soft leaves. Compact, but well closed head which is easier to harvest

Disease package: BI:16-25, 27, 28, 30-32, NR:0

RODANICE

Light green, oakleaf lettuce with a good tolerance to tipburn. Voluminous plant, resistant to bolting. Easy to process.

Disease package: : BI: 16-28, 30-32, Nr:0, LMV:1

BELGARDE

Deep red colour throughout its cultivation period. Good volume and dense heart without closing. Nice flat base easy to harvest

Disease package: Bl: 16-26,32, Nr:0

HUSSARDE

Traditional oakleaf type, with an original shape. Long lanceolate leaves of anthocyanic dark green colour.

Disease package: LMV:1

YZARDE

Red oakleaf lettuce presenting a good weight/ volume ratio. Good quality base. Very good tolerance to bolting. Well suited for cultivation in warm conditions.

Disease package: Bl: 16-33, Nr:0

BERENICE

Traditional oakleaf type, with long lanceolate leaves of bright green colour. Versatile variety with good tolerance to bolting.

Disease package: LMV:1

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

Onion Range slowly building up

By Fanie Verwey and Christo le Grange – National Product Development Manager, Hygrotech

Allium Cepa a.k.a onion is grown in South Africa from the Western Cape to the far North regions. This crop is seen as one of the more important vegetable groups, since onions are basically consumed everywhere. Hygrotech and Seedcor are always looking for more material that could be cultivated by farmers in the South African market.

Early Vonden F1 & Vonden Gold F1 are currently seen as market leaders in the Central Region of South Africa, specifically within the 'over winter' sowing slot. They are both fast growing hybrid cultivars, and provide excellent bulb shape and size, as well as descent colouring characteristics.

Initially introduced and commercially available since 2014, Vonden F1 has established itself as the cultivar of choice for most commercial growers as an adaptable and well established early short-day type onion. Vonden Gold F1 was first trialed in 2016 and proved to be slightly quicker in growing time, compared to the normal Vonden F1. Its popularity is slowly gaining ground as the workability in packing facilities are being commissioned to accommodate the slight differences between Vonden F1 and Vonden Gold F1.

Both Vonden and Vonden Gold F1 have very high yield potential, realizing 90-110 tons of marketable bulbs on a continuous basis, year on year. The ideal planting date in the Northern Cape and Western Free State is between 15-25 April.

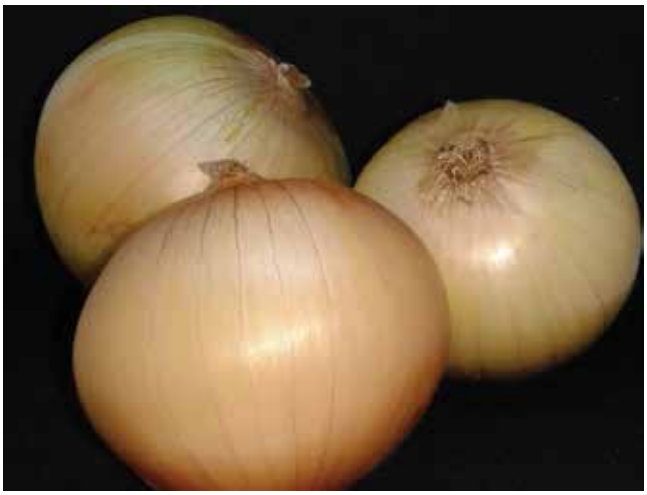
In the later short-day length category, Hygrotech is still busy with development and some exciting new cultivars are coming to the fore. Provisional trial data and results in this regard are presenting great possibilities for introduction in the near future.

Vonden - Northern Cape

The late short-day planting slot is one of the biggest variety segments. Hygrotech is proud to showcase the two cultivars **Hazel F1 & Hickory F1.** Both these cultivars have shown promising results in most growing areas, apart from the Western Cape. Currently suggested planting slots provide a wide window between March and April in the Limpopo area, moving on to May and into June preferred in the Northern Cape. Contact your local branches and crop specialists for more detailed planting suggestions.

Hazel - Northern Cape planting.

Hickory - Northern Cape



Hazel - Limpopo planting

New edition to sweet pepper range:

Gladiator F1

By Christo le Grange: National Product Development Manager

We are proud to announce the next big contender in the sweet pepper arena called Gladiator F1.

This cultivar stood out in the Limpopo & Komatipoort regions. Previously known as HY 1295, it made a noticeable impact on all the farmers during the Marlo farmers day earlier this year and once again as the crown jewel during the Komatipoort information day during October.

Like a good red wine, Gladiator F1 matures slowly into a maroon red full colour. A long period of consistant green colour is an attractive option for most of the farmers. Average weight of about 200 – 300g fruit will provide the needed yield potential everyone requires. Gladiator F1 has proven its worth already in the Central, Highveld, Lowveld and Limpopo regions, while final work is still been done near the coastal and southern regions. Gladiator F1 has an impressive disease package and could be cultivated under net house conditions as well as open field productions. **TMV (L4), BLS 1-3, PVY** and **TSWV** will give any grower the needed insurance for a good pepper crop.

In 2018, Hygrotech introduced **Floyd F1** and we are proud that this cultivar is already becoming a leader in the pre-pack and sleeve market. **Gladiator F1** is the 'big brother' everybody was asking for. Loose as well as box market option if bigger fruit is required. Combination productions of **Gladiator F1** and **Floyd F1** will ensure multiple market supply options for the grower. Loose, box and sleeve markets are the current preferred trends.

Hygrotech's net house and open field sweet pepper range is turning into and excellent option for any grower cultivating these crops. With the new edition of **Gladiator F1,** we believe that we could support the growers in all conditions during the production season. **Rubistar F1** is another success story from the programme and where **Phytophthora** is a concern, this is the option. This high yielding loose and box option has taken South Africa by storm.

Gladiator F1 will be available from the end of 2019/ beginning of 2020. Make sure to talk to your closest regional office to ensure that we have your requirements on record.

Do not miss out!!!

VEGETABLE RELATED DISEASES AND CODES

DISEASE CODE		
Alliums - A. ampeloprasum and A. cepa **(Leek and Onion)**		
Scientific name	**English common name**	**Code**
Bacteria		
Pseudomonas syringae pv. porri	Pseudomonas leek blight	Psp
Fungi		
Botrytis allii	Botrytis neck rot	Ba
Botrytis squamosa	Botrytis leaf blight	Bs
Fusarium oxysporum f. sp. cepae	Basal rot	Foc
Puccinia allii	Rust	Pa
Pyrenochaeta terrestris	Pink root	Pt
Sclerotium cepivorum	White rot	Sc
Beta vulgaris **(Table beet and Swiss chard)**		
Scientific name	**English common name**	**Code**
Viruses		
Beet curly top virus	Beet curly top	BCTV
Beet necrotic yellow vein virus	Rhizomania	BNYVV
Bacteria		
Pseudomonas syringae pv. aptata	Bacterial blight	Psa
Streptomyces scabies	Common scab	Ss
Fungi		
Cercospora beticola	Leaf spot	Cb
Fusarium oxysporum f. sp. betae	Fusarium yellows	Fob
Rhizoctonia solani	Rhizoctonia root and crown rot	Rs
Verticillium albo-atrum	Verticillium wilt	Va
Verticillium dahliae	Verticillium wilt	Vd
Brassicas **(Cabbage, Broccoli, Cauliflower, Chinese cabbage…)**		
Scientific name	**English common name**	**Code**
Viruses		
Cauliflower mosaic virus	Cauliflower mosaic	CaMV
Turnip mosaic virus	Turnip mosaic	TuMV
Bacteria		
Pseudomonas syringae pv. maculicola	Bacterial leaf spot, Peppery leaf spot	Psm
Xanthomonas campestris pv. campestris	Black rot	Xcc
Fungi		
Fusarium oxysporum f. sp. conglutinans	Fusarium yellows	Foc
Fusarium oxysporum f. sp. rapae	Fusarium yellows	Foa
Plasmodiophora brassicae	Clubroot	Pb

Capsicum annuum (Pepper)		
Scientific name	**English common name**	**Code**
Viruses		
Pepper mild mottle virus	Pepper mild mottle	PMMoV
Pepper mottle virus	Pepper mottle	PepMoV
Pepper yellow mosaic virus	Pepper yellow mosaic	PepYMV
Pepper mottle virus	Potato Y	PVY
Tobacco etch virus	Tobacco etch	TEV
Tobacco mosaic virus	Tobacco mosaic	TMV
Tomato mosaic virus	Tomato mosaic	ToMV
Tomato spotted wilt virus	Tomato spotted wilt	TSWV
Bacteria		
Ralstonia solanacearum	Bacterial wilt	Rs
Xanthomonas campestris pv. vesicatoria 2	Bacterial spot	Xcv
Fungi		
Phytophthora capsici	Phytophthora blight	Pc
Nematodes		
Meloidogyne arenaria	Root-knot	Ma
Meloidogyne incognita	Root-knot	Mi
Meloidogyne javanica	Root-knot	Mj
Citrullus lanatus (Watermelon)		
Scientific name	**English common name**	**Code**
Viruses		
Cucumber mosaic virus	Cucumber mosaic	CMV
Papaya ringspot virus	Papaya ringspot	PRSV
Watermelon mosaic virus	Watermelon mosaic	WMV
Zucchini yellow mosaic virus	Zucchini yellow mosaic	ZYMV
Fungi		
Colletotrichum orbiculare	Anthracnose	Co
Fusarium oxysporum f. sp. niveum	Fusarium wilt	Fon
Podosphaera xanthii	Powdery mildew	Px
Cucumis melo (Melon)		
Scientific name	**English common name**	**Code**
Viruses		
Cucumber mosaic virus	Cucumber mosaic	CMV
Cucumber vein yellowing virus	Cucumber vein yellowing	CVYV
Cucurbit yellow stunting disorder virus	Cucurbit yellow stunting disorder	CYSDV
Melon necrotic spot virus	Melon necrotic spot	MNSV
Moroccan watermelon mosaic virus	Moroccan watermelon mosaic	MWMV
Papaya ringspot virus	Papaya ringspot	PRSV
Watermelon mosaic virus	Watermelon mosaic	WMV

Zucchini yellow mosaic virus	Zucchini yellows	ZYMV
Fungi		
Fusarium oxysporum f. sp. melonis	Fusarium wilt	Fom
Pseudoperonospora cubensis	Downy mildew	Pcu
Podosphaera xanthii	Powdery mildew	Px
***Cucumis sativus* (Cucumber)**		
Scientific name	**English common name**	**Code**
Viruses		
Cucumber mosaic virus	Cucumber mosaic	CMV
Cucumber vein yellowing virus	Cucumber vein yellowing	CVYV
Papaya ringspot virus	Papaya ringspot	PRSV
Watermelon mosaic virus	Watermelon mosaic	WMV
Zucchini yellow mosaic virus	Zucchini yellows	ZYMV
Bacteria		
Pseudomonas syringae pv. lachrymans	Angular leaf spot	Psl
Fungi		
Cladosporium cucumerinum	Scab and gummosis	Ccu
Colletotrichum orbiculare	Anthracnose	Co
Fusarium oxysporum f. sp. cucumerinum	Fusarium wilt	Foc
Fusarium oxysporum f. sp. radicis-cucumerinum	Fusarium crown and root rot	For
Pythium aphanidermatum	Damping off , Pythium fruit rot (cottony leak)	Pa
Pseudoperonospora cubensis	Downy mildew	Pcu
Podosphaera xanthii	Powdery mildew	Px
***Cucurbita pepo, C. maxima, C. moschata* (Squash and pumpkin)**		
Scientific name	**English common name**	**Code**
Viruses		
Cucumber mosaic virus	Cucumber mosaic	CMV
Papaya ringspot virus	Papaya ringspot	PRSV
Moroccan watermelon mosaic virus	Moroccan watermelon mosaic	MWMV
Zucchini yellow mosaic virus	Zucchini yellows	ZYMV
Fungi		
Fusarium oxysporum f. sp. cucumerinum	Fusarium wilt	Foc
Fusarium oxysporum f. sp. lagenariae	Fusarium wilt	Fol
Fusarium oxysporum f. sp. cucumerinum	Fusarium wilt	Fom
Fusarium oxysporum f. sp. melonis	Fusarium wilt	Fon
Fusarium oxysporum f. sp. niveum	Root and stem rot	For
Phomopsis sclerotioides	Black root rot	Ps
Phytophthora capsici	Phytopthora crown and root rot	Pc
Pseudoperonospora cubensis	Downy mildew	Pcu
Podosphaera xanthii	Powdery mildew	Px

Daucus carota var. sativa (Carrot)		
Scientific name	**English common name**	**Code**
Bacteria		
Xanthomonas hortorum pv. Carotae	Bacterial leaf blight	Xhc
Fungi		
Alternaria dauci	Alternaria leaf blight	Ad
Alternaria radicina	Black rot	Ar
Pythium sulcatum	Cavity spot	Ps
Pythium ultimum	Cavity spot	Pu
Pythium violae	Cavity spot	Pv
Nematodes		
Meloidogyne incognita	Root-knot	Mi
Meloidogyne javanica	Root-knot	Mj
Phytoplasmas		
Aster yellows	Aster yellows	Ay
Phaseolus vulgaris **(Dwarf and climbing French bean)**		
Scientific name	**English common name**	**Code**
Viruses		
Bean common mosaic virus	Bean common mosaic	BCMV
Bean yellow mosaic virus	Bean yellow mosaic	BYMV
Bacteria		
Pseudomonas savastanoi pv. phaseolicola	Halo blight	Psp
Pseudomonas syringae pv. syringae	Bacterial brown spot	Pss
4Xanthomonas axonopodis pv. phaseoliCommon or fuscous blight Xap4	Common or fuscous blight	Xap4
Fungi		
Colletotrichum lindemuthianum	Anthracnose	Cl
Uromyces appendiculatus	Rust	Ua
Solanum lycopersicum **(ex Lycoperscicon esculentum) (Tomato)**		
Scientific name	**English common name**	**Code**
Viruses		
Tobacco mosaic virus	Tobacco mosaic	TMV
Tomato mosaic virus	Tomato mosaic	ToMV
Tomato spotted wilt virus	Tomato spotted wilt	TSWV
Tomato yellow leaf curl virus	Tomato yellow leaf curl	TYLCV6
Bacteria		
Pseudomonas corrugata	Pith necrosis	Pc
Pseudomonas syringae pv. tomato	Bacterial speck	Pst
Ralstonia solanacearum	Bacterial wilt	Rs
7 Xanthomonas campestris pv. vesicatoria	Bacterial spot	Xcv
Fungi		
8 Fulvia fulva (now Passalora fulva)	Leaf mold	Ff (now Pf)
Fusarium oxysporum f. sp. lycopersici	Fusarium wilt	Fol

Fusarium oxysporum f. sp. radicis-lycopersici	Fusarium crown and root rot	For
Leveillula taurica (anamorph: Oidiopsis sicula)	Powdery mildew	Lt
Stemphylium solani	Gray leaf spot	Ss
Verticillium albo-atrum	Verticillium wilt	Va
Verticillium dahliae	Verticillium wilt	Vd
Nematodes	Root-knot	Ma
Meloidogyne arenaria	Root-knot	Mi
Meloidogyne incognita	Root-knot	Mj
***Solanum torvum* (Eggplant rootstock)**		
Scientific name	**English common name**	**Code**
Bacteria		
Ralstonia solanacearum	Bacterial wilt	Rs
Fungi		
Fusarium oxysporum f. sp. melongena	Fusarium wilt	Fom
Verticillium albo-atrum	Verticillum wilt	Va
Verticillium dahliae	Verticillum wilt	Vd
Nematodes	Root knot	Mi
Meloidogyne incognita		
Meloidogyne mayaguensis (Syn. M. enterolobii)	Root knot	Me
Meloidogyne arenaria	Root knot	Ma
Meloidogyne javanica	Root knot	Mj
***Spinacia oleracea* (Spinach)**		
Scientific name	**English common name**	**Code**
Fungi		
Peronospora farinosa f. sp. spinaciae (now Peronospora effusa)	Downy mildew	Pfs (now Pe)
Verticillium dahliae	Verticillium wilt	Vd
Verticillium wilt		
***Zea mays* (Sweet corn)**		
Scientific name	**English common name**	**Code**
Viruses		
Maize dwarf mosaic virus	Maize dwarf mosaic	MDMV
Sugarcane mosaic virus	Sugarcane mosaic	SCMV
Bacteria		
Pantoea stewartii	Stewart's wilt	Pst
Fungi		
Bipolaris maydis	Southern corn leaf blight	Bm
Puccinia polysora	Southern rust	Pp
Puccinia sorghi	Common rust	Ps
Ustilago maydis	Common smut	Um

CONTINIOUS VEGETABLE PRODUCTION IN BOTSWANA BY AGRICHEM/HYGROTECH

Written by Luhan Swart – Technical Manager

Farming with vegetables in Botswana follows a holistic approach where every factor influencing crop production are considered from the planning phase. When everything is done 'off the grid' using only solar power as energy source, people start to realise that where there is a will, a need and commitment, anything is possible. One needs to understand the complexity of the environment with a low average rainfall, soil type differences and poor quality underground water supply sources.

A training workshop for farmers was held on the 20th August 2019 at the demonstration site north of Francistown on the farm of Donald Mavor where Agrichem NR and Hygrotech joined efforts with local farmers and service suppliers. More than 100 farmers attended the practical demonstrations and information sessions on growing vegetables in Botswana.

The site consists of 3ha arable land with sandy soils, 10% clay and was developed as a green field project off the grid with solar electricity, starting from bush clearing, land preparations, soil fertility balancing and soil conditioning practices. Cultural practices like soil preparation actions, forming of ridges and irrigation planning all contributed to the successful demonstration of a winter crop production of several vegetable types varieties and cultivars.

Right from the start it was known with which type of soil we were working with and the fertility status thereof. The water source, coming from a dry sandy riverbed, was analyzed and the water quality and classification thereof were identified by the Hygrotech analytical service department. The irrigation is done under drip irrigation using 30cm inline drippers every 1m of ridged beds. The design basis of the irrigation has blocks opening the volume as per irrigation schedule and pump delivery capacity through drippers per hourly schedule, depending on the crop development stages.

The farmers who attended the information day were advised to test their water and soils before attempting vegetable production. In some situations Na levels are so high in the water from boreholes, that specific crops like beetroot and spinach (swiss chard, kyle, cabbages and tomatoes/peppers under drip) will grow, but crops such as beans and peas will not do well. Therefore, using drip irrigation and not any overhead irrigation became a rule in Botswana for vegetable production. Basic principles of fertilization and crop rotation were explained.

IN SHORT, KNOW WHAT YOU HAVE AND WORK WITH THAT!

Practice what you preach and lead by example.The information day was concluded with a tour through the demo plots on the side

"One needs to understand the complexity of the environment with a low average rainfall, soil type differences and poor quality underground water supply sources"

"Farming in Botswana with vegetables follows a holistic approach where every factor influencing crop production are considered and need commitment"

PROCESSING TOMATOES are facing a real challenge and the industry for tomato paste is looking for alternatives.

Written by Luhan Swart – Technical Manager

Continuous processing tomato production in the northern parts of South Africa in the Limpopo province has created a 'man-made' disease problem.

Fusarium race 3 (F3) and a complex of Gemini virus problems namely TYLC (Tomato Yellow Leaf Curl Virus) has yet to be identified as the specific problem which is transmitted by sucking insects such as white fly, leaf hoppers as well as thrips. All these vectors are now able to exponentially increase in populations and to over-winter in other host crops such as cotton, citrus and other hosts allowing the population to thrive in specific areas such as Weipe/Pontdrift, Nwanedi, and other frost free parts of the northern Lowveld of Limpopo. Colder areas of the western Bushveld in Limpopo (Tom Burke, Swartwater, Baltimore) can still do successful production of processing tomatoes, but are more exposed to white and black frost. The occurrence of the Gemini virus complex is much less in these areas due to white flies not preferring cold conditions (5 degrees celcius and colder) just before frost.

Continuous production with minimal focus on crop rotation has also contributed to the above problem, but also the buildup of Fusarium race 3 in soils, making older varieties like HTX14 NOT TO PREFORM as previously (10 years ago). The traditional growing areas for winter processing tomatoes to paste production had no rest time free from any susceptible hosts both for TYLC and F3.

Therefore a huge drive towards cultivar identification suitable to overcome the above problems with the full range of disease packages is underway currently and more than 30 varieties have been included in the past seasons trials with the processors.

The results of these trials are still being processed and will be available in the next Forum for planting before winter.

Some of the highlights we have seen are **HTP 328*, Qwanto, Rulander*** as well as new trial varieties under code.

Trial harvesting pictures as well as seasonal development pictures of promising HTP 328.

Komatipoort Information Day 2019

-On a beautiful summer's day

Written by Michael Luttig: Area Marketing Manager, Mpumalanga, Mbombela

The fifth consecutive Komatipoort Information Day was held at JF Steyn Boerdery, Strydomsblok, Komatipoort on Thursday, 24 October 2019. The information day was well attended by 60 farmers and nurseries from Komatipoort, Malelane as well as from Limpopo, Mozambique, Swaziland and Kwazulu-Natal.

This annual day is unique as Hygrotech gets the opportunity to showcase its commercial as well as experimental new vegetable varieties in a trial treated under the same conditions as the farmers commercial crop and in the same climatic conditions that farmers plant vegetables in the Komatipoort area. Hygrotech clients were welcomed under the trees at the dam at JF Steyn Boerdery by Hygrotech Nelspruit Area Manager, Michael Luttig.

Charl Kotze, Technical Manager, Northern Region gave a presentation on powdery mildew disease on sweet peppers. He gave an overview on this destructive leave and fruit disease and gave advice how to control and keep pepper plants free from powdery mildew. Hygrotech clients went to the trial site were a display of vegetable types from the trial plots were presented.

Clients had the opportunity to discuss the vegetable varieties with 17 Hygrotech personnel, including, Christo le Grange, Hygrotech National Product Development Manager - Vegetables and Lodewyk van Staden, Sales Representative from Hygrotech Nelspruit.

Vegetable varieties showed for the first time included sweet pepper Gladiator, hawkers and processing tomato HTP 328 and new hybrid lunchbox snack peppers Sweet Rose F1, Sweet Light F1, Sweet Ginger F1 with colours red, yellow and orange respectively. Hokkaido (Red Kuri Squash) orange type pumpkin Amoro and exciting new butternut varieties such as HSC 173 and Crusader. Chillies such as Jalapino Tharos, Large fruited Jalapino Fermin, Indian Thai Darco, Cayenne Super Flavor, Birds Eye Eagle and Habaneros were displayed.

Michael Luttig thanked Jakkals Steyn and sons Francois and Ruan for the opportunity to do vegetable trials as well as allowing Hygrotech to hold an information day on their farm. Francois Steyn, on behalf of the Steyn family, accepted a gift presented by Hygrotech CEO Henry van der Voort.

Francois Steyn on behalf of the Steyn family accepted a gift presented by Hygrotech CEO, Henry van der Voort

Charl Kotze, Technical Manager, Northern Region gave a presentation on powdery mildew disease on sweet peppers

Clients listening with attention to Charl Kotze's presentation on powdery mildew

Local farmers listening with attention to a presentation

Clients listening with attention to Charl Kotze's presentation on powdery mildew on sweet peppers

Clients were able to inspect the vegetable varieties displayed as well as fruit on plants in the different trial plots

Clients were able to inspect the vegetable varieties displayed as well as fruit on plants in the different trial plots

Rajan Rajcoomher from Hygrotech PMB, Kwazulu-Natal shows different chilli varieties to clients

Clients were able to inspect the vegetable varieties displayed as well as fruit on plants in the different trial plots

SUCCESS WITH TOMATO SCX 824

Compiled by Renier van Rooyen – Marketing officer: George branch, Southern Cape

Hendrik Schoeman of the farm Nooitgedacht between Oudtshoorn and Calitzdorp in the 'Klein Karoo' planted tomato SCX 824 against two comparative opposition cultivars under a 0.72 hectare shade net structure.

The production site was divided in 3 equal sizes with 6,120 seedlings per cultivar. The seedlings were planted on 21 November 2018 with a row spacing of 400 mm in the row and staggered 500 mm from each other. The plant stand came to 2.5 plants per m^2. The plants were irrigated by a dripper line on a plastic ground cover. Prior to planting, the soil was treated with an organic fertilizer and the seedlings were dipped in a root development activator. Fertilizers were also applied through the dripper line.

The tomato plants were trellised to a height of 3 meter. During the hot periods tomatoes were picked 3 times per week and twice a week when temperatures dropped. A comprehensive spraying programme was followed for the control of diseases and insects.

The first fruit were picked on 25th January 2019. On 7th March and again on 21st March, ten rows of each cultivar were picked which were then placed on the sorting table in 5 kg boxes of all the different sizes. The table below indicates the results of SCX 824 :

As seen from the above table, the majority of SCX 824 tomatoes could be classified as SM (small medium). The

Class	3rd + 2nd Grade	SS	S	SM	M	M+	
Percentage	4%	4%	6%	56%	29%	0.3%	7 March
Percentage	4%	9%	19%	42%	26%	0.5%	21 March
Average	4%	6.5%	12.5%	49%	27.5%	0.4%	

sizes of these tomatoes were not detrimental on the Rand income as SM tomatoes fell right into the size of the market tendency at the time. What was lost in size, was gained in quantity / yield. Colour, taste and retaining quality, was a major factor in the demand of all 3 cultivars.

Because there was no preference at the time, exactly the same procedure was followed with all tree cultivars. **SCX 824 though, significantly made up 45 % of the total weight picked by the 21st March from all 3 lots together.**

30 April: total yield per plant – 6.32 kg
8 May: total yield per plant – 7.24 kg
22 May: total yield per plant – 8.43 kg
3 June: total yield per plant – 8.9 kg

Strong deep root system of SCX 824

FEEDBACK: The effect of a programme consisting of ColourUp and SugarExpress® on citrus colouring

By: Charl Kotze, Johann van der Vyver and Fielies Nieuwoudt

In most crops the determining factor of its quality is of a visual nature and in this case the objective is an acceptable colour. Due to our changing climate, fruit colour is becoming an increasing problem to growers, with crops achieving internal maturity long before the external has reached an acceptable level needed for export. This can have serious consequences on the grower's exportable volumes and the price received. Therefore, to address the problem the ability of Colour Up (Reg. no. B3386 of Act 36 of 1947)) and Sugar Express® (Reg. no. K6716 of Act 36 of 1947) to enhance fruit colour was assessed on two citrus types.

Figure 1. Star Ruby (A + B) and Marsh (C + D) grapefruit fruit from trials in Letsitele that received 2 ColourUp treatments at 42 and 28 days before harvest, as well as a ColourUp and SugarExpress® tank mixture 14 days before harvest. A: Star Ruby grapefruit observed before the first application. B: Star Ruby grapefruit observed 28 days after the first application. C: Marsh grapefruit observed before the first application. D: Marsh grapefruit observed 28 days after the first application.

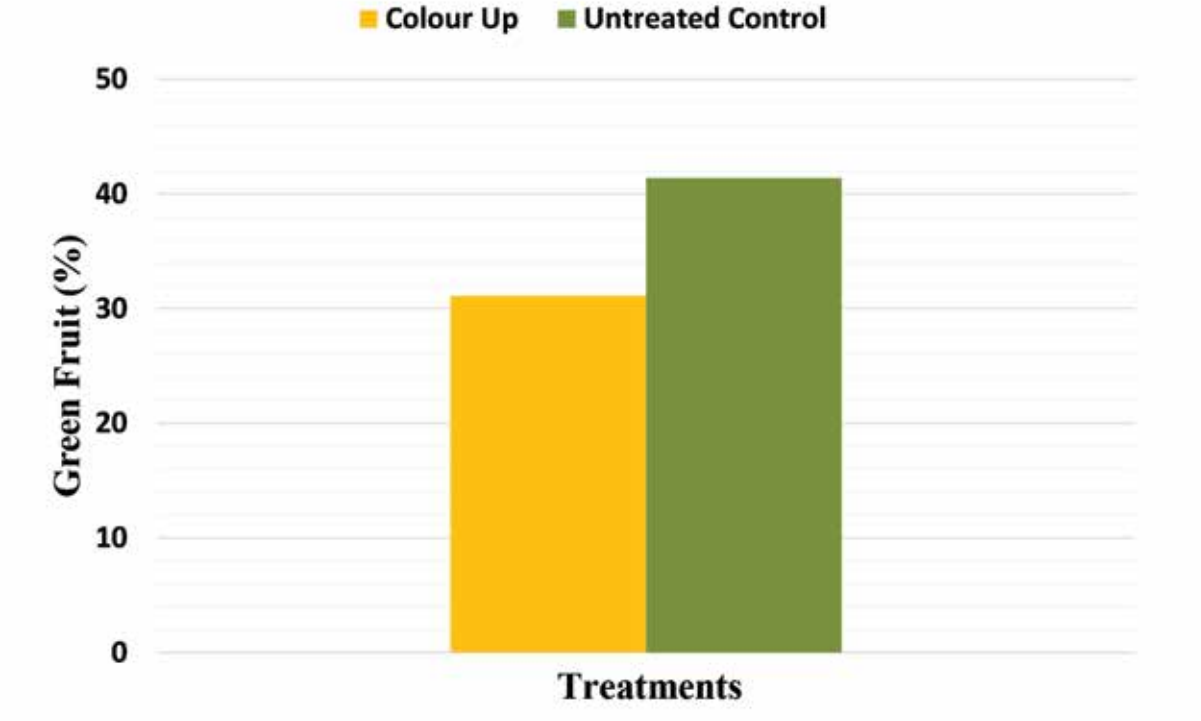


Figure 2. Citrus packhouse assessment indicating percentage green Lavelle Late Valencia fruit from untreated trees vs trees treated with Colour Up at 14-day intervals from 28 days before estimated harvest.

Trial info, Assessments and Results

For the trials two citrus types were chosen at various locations in the Limpopo Province of South Africa. These were, Marsh and Star Ruby grapefruit in Letsitele and Lavelle Late Valencia (sweet oranges) in Groblersdal. At the Letsitele trial site, Colour Up was applied at 2 L/ha at 14-day intervals from 42 days before the estimated time of harvest. During the last application, 14 days before harvest, 10 kg/ha Sugar Express® was added to the tank mixture. Applications were conducted with an Arbus 2000 tower sprayer calibrated to 2200 L water per ha, which accumulates to a medium cover.

The trial conducted at Groblersdal consisted of two ColourUp applications applied at 2 L/ha every 14 days from 28 days before the estimated time of harvest. The foliar applications were conducted using a Johnson Ultima tower sprayer, calibrated to 4000 L (also medium cover) water per ha. One half of a 2.2-hectare orchard was treated with ColourUp while the other half was left unsprayed and served as the untreated control. Each of the trials was assessed differently.

For the grapefruit a visual assessment was conducted 7 days before the estimated harvest (Fig 1). Although no data was collected, the growers (present during the assessment) had consensus that a very even colour was achieved from the programme.

This visual assessment was supported by data collected from the trial in Groblersdal. Each half of the trial site was harvested separately and digitally assessed in the packhouse through the COMPAC system. The untreated block had a total of 41.1% green fruit while the ColourUp treated block had 31.7% green fruit. (Figure 2).

Conclusion

Although no numerical data was collected from the trial site in Letsitele, there was a visible even colouring of the two grapefruit cultivars. Both these cultivars are notoriously known for their uneven colouring. The Lavelle Valencia trial on the other hand showed a decrease of 9.4% in green fruit. Which means an almost 10% increase in exportable yield, resulting in a higher remuneration. Trials will continue next season on high quality cultivars as these trials were conducted on cultivars known for their difficulty to colour.

FEEDBACK: Successful and safe weed killing with Glufosinate-ammonium herbicide + Entrée™ + Mist Control®

By Johann van der Vyver: Miller® Technical Sales Director – African Region

Miller® recently received feedback from a commercial investigation with two of its popular adjuvants. The two adjuvants were tank-mixed with a Glufosinate-ammonium herbicide as part of weed control in a citrus orchard near Groblersdal in the Mpumalanga Province of South Africa. The one adjuvant was Entrée™ (Reg. no. L8055 of Act 36 of 1947), an activator enhancer, known for initial adhering (limiting run-off) and spreading of herbicide application on the weed surface and then facilitating the accelerated absorption of the herbicide by the weed.

The other adjuvant was Mist Control® (Reg. no. L4567 of Act 36 of 1947), a drift retardant and deposition aid. Thus, a clear objective, to maximise the efficacy of the herbicide, while at the same time keeping the application safe and accurate by limiting the risk of possible off-target application (onto the crop) of the herbicide spray. The rates used were 250 ml Mist Control®/ 100 L water, 500 ml Entrée™/ ha and 5 L glufosinate-ammonium herbicide / ha in an application volume of 180 – 200 L water/ ha. The customer proclaimed the results as very satisfactory with excellent weed control. (Information and photos supplied by Mr. Kevin Language – Inteligro).

Photo taken one week after herbicide application on weeds in a citrus orchard. Red dotted line indicates separation between herbicide treated area (indicated with red arrows) and untreated area. Note the size of the *Conyza* sp. weed that was treated and already showing symptoms of deterioration despite to herbicide treatment. Also note that the citrus trees have no adverse symptoms due to the nearby herbicide treatment.

Photo taken three weeks after herbicide application on weeds in a citrus orchard. Red dotted line indicates separation between herbicide treated area (indicated with red arrows) and untreated area. Note the dead *Conyza* sp. as a result of the herbicide treatment three weeks earlier.

Mist Control®, Sustain® and Entree™ are trademarks of Miller™ Chemical & Fertilizer, LLC in Hanover, Pennsylvania.

AS-sistance contains 820 g/L Ammonium sulphate. Reg. No. L8015 of Act 36 of 1947.

Hygrobuff contains 85 g/L Alkylaryl Polyoxyethylene Glycol Phosphate ester & 477 g/L Organic acid buffer system. Reg. No. L5512 of Act 36 of 1947. Surebuff contains 480 g/L Acidifier/Buffer. Reg. No. L6539 of Act 36 of 1947.

Mist Control® contains 20 g/L Polyvinyl polymer. Reg. No. L4567 of 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 blend. Reg. No. L8055 of Act 36 of 1947.

Hygrotech South Africa (Pty) Ltd is the principal supplier of these products.

Hygrotech Properties (Pty) Ltd is the registration holder of AS-sistance, Hygrobuff 4, Mist Control® and Surebuff. 1 Gerard Braak Street, Pyramid, 0120, Tel. +27 12 545 8000

Miller™ Chemical South Africa (Pty) Ltd is the registration holder of Entree™ and Sustain®. 215 Jack Hindon Street, Pretoria North, 0182.

MILLER® AND HYGROTECH: MAIN SPONSORS at 2019 CRI INTEGRATED PEST AND DISEASE MANAGEMENT WORKSHOPS

By Johann van der Vyver: Miller® Chemical & Fertilizer Technical Sales Director – African Region

Citrus is South Africa's largest export fresh commodity. South Africa produces citrus on more than 80 000 ha and is the second largest global exporter of citrus. In 2018 76% of SA citrus was exported. This was 136 million cartons or more than 2 million tons of citrus!

To maintain this high quality fruit production, detailed up-to-date knowledge and strategies towards weather challenges, pests, diseases and various export regulations (to destination countries) are of vital importance. In these aspects, Citrus Research International (CRI) is a vital ally for SA citrus producers.

CRI (from www.citrusres.com)

"CRI is a research and technical services organisation based in Southern Africa that focusses primarily on citrus. CRI coordinates and funds research conducted by the CRI Group which includes close collaboration between CRI and a wide range of partners. There is a strong focus on the Southern African citrus industry's needs as they relate to the industry's heavy reliance on export of fresh fruit to global markets". Frequent national study group meetings, postharvest workshops (prior to the start of the annual packing season) and integrated pest and disease management workshops (prior to the start of the production season) are part of CRI's mission "to maximise the long-term global competitiveness of the Southern Africa citrus growers through the development, support, co-ordination and provision of Research and Technical services by combining strengths of all CRI Group partners".

A road trip of > 6600 km in 3 weeks

2019 CRI INTEGRATED PEST AND DISEASE MANAGEMENT WORKSHOPS

Miller® and Hygrotech were the main sponsors of these workshops during August and September 2019. This was a road trip of note (> 6600 km) as Johann van der Vyver and Charl Kotze (Hygrotech Crop Specialist: Citrus) accompanied CRI experts to the various venues across the country. The two day workshops were held at Letsitele, Groblersdal, Nelspruit, Addo and Paarl.
All the workshops were well attended with almost 900 delegates altogether. The success of these workshops was the detailed presentations of relevant topics by CRI, providing practical advice and solutions.

TOPICS INCLUDED:

- Market access.
- False codling moth (FCM) risk management system feedback.
- Fruit fly management system (FFMS) feedback.
- Status and threat of Huanglongbing (HLB) and Asian Citrus Psyllid in Africa.
- HLB action plan.
- Africa greening: Monitoring and control.
- FCM and carob moth management.
- FFMS and research updates on fruit fly control.
- Implementing IPM.
- Thrips and mealybug monitoring and management.
- Red scale management.
- IPM under nets.
- Spray volume and basic principles for effective spray application.
- Epidemiology, prediction and management of Alternaria.
- CRI PhytRisk and citrus black spot management.
- Control of soil borne diseases.
- Control of Botrytis.

For further study, delegates received all presentations on Miller® and Hygrotech branded USB drives. As main sponsors Miller® and Hygrotech had the opportunity to introduce the companies and products ideally suited for citrus: AscoGro, Hygrophos 400, Nu-Film® 17 and Surebuff. Producers were also rewarded for paying attention to the workshop presentations. On two occasions, workshop related questions were asked and the first correct person to answer was rewarded with Hygrophos 400 and/ or Nu-Film® 17, enough for one hectare of citrus. Hygrotech sales personnel also welcomed producers at the Miller® and Hygrotech exhibition area at each venue. Refer to the photos that follow for a pictorial summary of the workshops.

Miller® and Hygrotech wish to thank CRI again for the privilege to be involved in the SA citrus industry by means

of this sponsorship. We look forward to the production season being able to serve the industry with current product solutions and new ones (following soon). Should you require information regarding Miller® and Hygrotech products suited for citrus, contact you nearest Hygrotech branch or charl.kotze@hygrotech.co.za

Miller® and Huber Share Vision of Sustainability and Responsible Agriculture

By Mike Fiery: Miller® Vice President International Sales and Product Development

Miller® Chemical & Fertilizer, LLC (Miller®) has a long history of producing branded specialty crop protection adjuvants, additives, soluble fertilizers and bio-stimulants for the global agricultural industry, with a focus on fruits, nuts and vegetables. It has proven to be an innovator in the industry, creating safe adjuvant products and crop nutrients that reduce the environmental impact of crop protection and farm productivity measures. Its core values of Honesty, Integrity, Passion, Teamwork and Stewardship have structured the company's culture since its founding in 1937.

It was the combination of sustainable products and services as well as the overall ethical company culture that made Miller® attractive to the family-owned portfolio management company, J.M. Huber Corporation (Huber), when seeking to diversify its collection of services and explore growth opportunities. Huber is headquartered in Atlanta, Georgia, USA, and has operations in over 20 countries around the world. The Company operates a diverse portfolio of businesses, including Huber Engineered Materials (HEM), which acquired Miller® in April 2019. HEM is a global business focused on engineered specialty ingredients that enhance the performance, appeal and processing of a broad range of products used in industrial, agricultural and consumer applications. It has a portfolio of high value products: speciality alumina trihydrate, magnesium hydroxide and molybdate compounds used for fire retardant additives, agricultural nutrients and adjuvants, and industrial, food and United States Pharmacopeia grade calcium carbonate.

Other Huber businesses include CP Kelco, which offers nature-based ingredients for food and beverages, personal care and countless other products around the world; Huber Engineered Woods, which provides high performance building envelope solutions, and Huber Resources Corp, which practices and supports sustainable forestry services. Though the portfolio is diverse, the Huber Principles unify company culture across businesses. These principles are **Environmental, Health & Safety Sustainability, Ethical Behavior, Respect for People, and Excellence.** For the Huber enterprise, these principles are a source of inspiration and innovation for employees world-wide, and each of the businesses promotes and develops these principles in its own way.

In August and September 2019, Miller® and its South African principal supplier, Hygrotech, were proud to sponsor the Integrated Pest and Disease Management Workshops of Citrus Research International (CRI) across South Africa (see article in this edition of the Hygrotech Forum). Being South Africa's largest exported fresh commodity, citrus plays a crucial role in providing employment opportunities. Miller® and Hygrotech are proud to have been able to contribute to these workshops with the purpose of finding appropriate solutions to various challenges and ensuring the future of the SA citrus industry. CRI's promotion of responsible and sustainable Good Agricultural Practices is in line with Miller® and Huber's business principles and generates a platform for the marketing of relevant Miller® products.

Huber is also involved in citrus across the Atlantic Ocean in Brazil. CP Kelco's brand promise is to "unlock nature-powered success". As one of the world's leading pectin (a viscosity building agent found in citrus peels) producers, CP Kelco is one of the largest buyers of Brazilian citrus. The limited availability of lemon and lime peels had historically hampered the sustainable growth of CP Kelco's pectin production. However, the company recently innovated a method to extract about 20% more pectin from citrus peels, reducing their raw material supply risk. Additionally, the process uses steam from biofuel as the heat source and minimizes water consumption, resulting in a more environmentally responsible and sustainable practice.

When the ultimate goal is to help customers win, a success for one of Huber's businesses is a success for the whole enterprise. Globally Miller® already provides products to farmers that support the healthy production of crops and assists crops to realize their genetic potential.

As part of Huber, Miller® will become even more focused on products that are both innovatively effective and sustainable towards the environment. Huber has the resources to support Miller® in achieving sustainable long-term growth while also providing more and enhanced sales and service channels, allowing Miller® and its business partners to serve customers better than ever before.

New label extension!!!!!

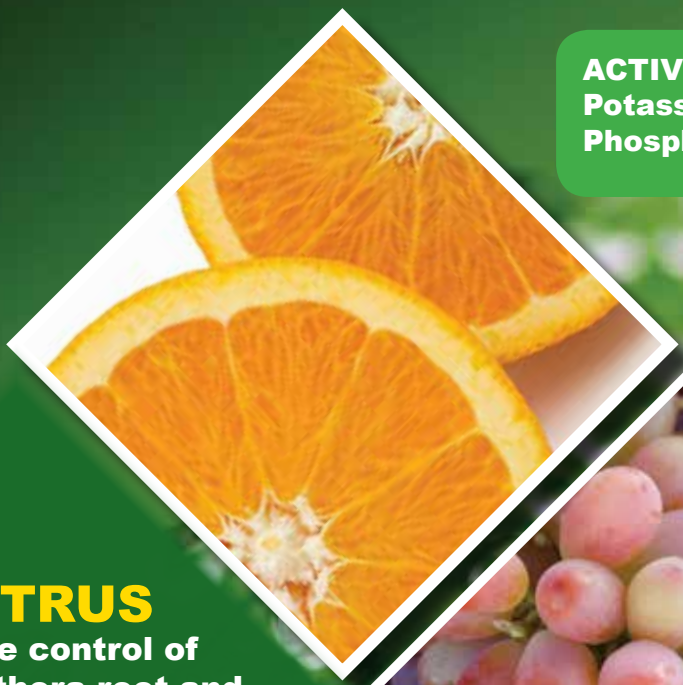
HYGROPHOS 400

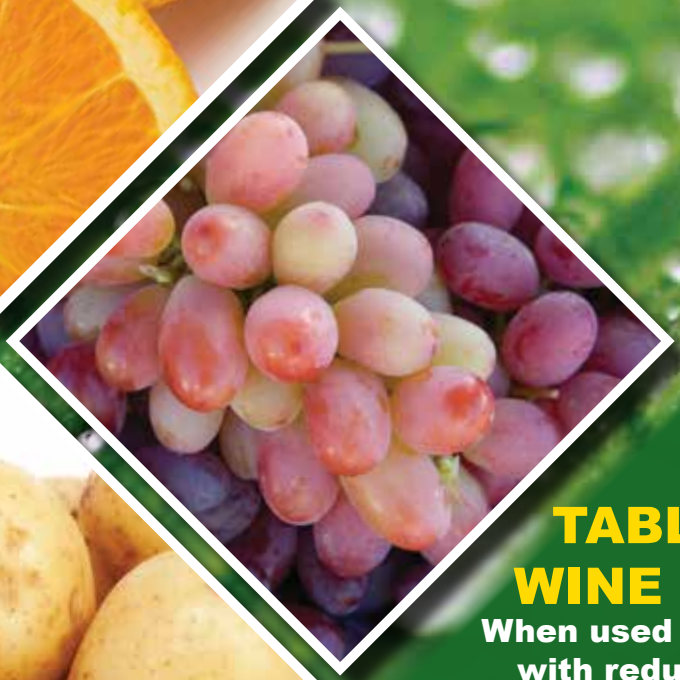
Reg no. L 7949, Act No. 36 of 1947

A liquid systemic water soluble fungicide for the control of Late Blight, Downey mildew and Phytophthora root and crown rot in various crops

ACTIVE INGREDIENT:

Potassium Phosphite	586 g/L (435 g/kg)
Phosphorus acid Equivalent	400 g/L (300 g/kg)





CITRUS

For the control of Phytophthora root and crown rot (Foliar and stem application)

TABLE AND WINE GRAPES

When used in combination with reduced doses of *Mancozeb, Hygrophos 400 provides efficient protection and control against Downey Mildew in grapes (table and wine)

POTATOES

When used in combination with reduced doses **Chlorothalonil, Hygrophos 400 provides efficient protection and control against potato late blight

* Mancozeb 800 WP is an active ingredient of numerous registered fungicide products.
** Chlorothalonil (500 g/ℓ) is an active ingredient of numerous registered fungicide products.

Always use plant protection products safely. Always read the label and product information before use for further information, contact your nearest agronomist or Hygrotech offices at 012 545 8000

Registered and manufactured by :
Hygrotech PROPERTIES (PTY) LTD/ Reg. No. 1984/00638/07
1 Gerard Braak Street, Pyramid, 0120, PO Box 17220, Pretoria North,
0116, Tel: (012) 545 8000 ▪ Fax: (012) 545 8088

HYGROTECH
SUSTAINABLE SOLUTIONS

FEEDBACK:
COMMERCIAL TRIALS WITH COLOURUP and SUGAR EXPRESS on *Blue Berries*

Written by Herman Walters – Fertagchem Manager: Hygrotech Western Cape

The production of blue berries is an agricultural sector which is growing at a phenomenal pace in South Africa.

It generates excellent income for the blue berry farmer and adds to the general economy. Harvesting peaks during September and October where after activities level out towards the end of December. Prospects for growth look promising with a projection of more than 19000-ton berries to be harvested this year. SA currently cultivates 1900 hectares of blue berries with an estimated increase to around 6 000 hectares by 2023. The berry industry has a labor ratio of 3:1 (3 workers per hectare), stimulating employment opportunities. The industry currently employs 5700 people.

Seventy percent of SA blue berries are exported, mainly to Europe and England. In terms of economic growth, the blue berry industry has significantly outperformed other fruit industries by growing its gross value of production from an estimated value of R15.8 million in 2008 to R1.25 billion in 2018 (information from Western Cape Department of Agriculture, 2019). This growth, and in particular that of the past four years, has seen the industry's value double every season as many of the newly established orchards are coming into production.

ColourUp and Sugar Express:

Both products are manufactured by Miller® Chemical & Fertilizer, LLC in Hanover, Pennsylvania, United States of America. ColourUp (Reg. no. B3386 of Act 36 of 1947) is a propriety translaminar liquid Calcium Complex which works with the plant's natural ripening and colouring stages on various fruit and vegetable types. Sugar Express® (Reg. no. K6716 of Act 36 of 1947) applications maximize normal photosynthetic processes which are a driving force required for °Brix accumulation.

Commercial investigations:

The Western Cape is SA's largest blue berry producing area, cultivating 60 % of the national hectares. Success of previous commercial investigations with ColourUp and Sugar Express® on table grapes and plums prompted Hygrotech to investigate the effect of the products on blue berries as well. These trials were conducted in conjunction with commercial growers at

LOCATION: Breede River 1 – CULTIVAR A		
EVALUTION (AVE of 3 harvest sets)	**TREATMENT Grower standard + ColourUp + Sugar Express®**	**TREATMENT Grower Standard**
°Brix	16	15
Berry size	18 mm	17.3 mm
Berry weight	1.75 g	1.70 g
Berry hardness (fresh)	63.3 durometer O	62.6 durometer O
LOCATION: Breede River 2 – CULTIVAR A		
EVALUTION (AVE of 3 harvest sets)	**TREATMENT Grower standard + ColourUp + Sugar Express®**	**TREATMENT Grower Standard**
°Brix	16	15
Berry weight	1.62 g	1.59 g
Berry hardness (after 4 weeks @ 4 °C)	35.7 durometer O	33.9 durometer O
LOCATION: Cape Winelands – CULTIVAR B		
EVALUTION (AVE of 3 harvest sets)	**TREATMENT Grower standard + ColourUp + Sugar Express®**	**TREATMENT Grower Standard**
°Brix	12	10
Berry weight	1.86 g	1.84 g
Berry hardness (after 4 weeks @ 4 °C)	49.4 durometer O	46.3 durometer O

three different locations in the Western Cape. ColourUp was applied during flowering stage at 1 L/ ha with a follow-up every 14 days with Colour Up (1 L/ ha) and Sugar Express® (10 kg/ ha) in a tank mix. In total ColourUp was applied six times and Sugar Express® five times in addition to the grower standard at each of the locations. ColourUp and Sugar Express® (additions) were compared with blue berries receiving grower standard programmes only. Evaluations included °Brix, berry size, weight and hardness. The results are indicated in Table 1.

At the three locations the average °Brix values of the berries were 1 – 2 °Brix higher where ColourUp and Sugar Express® were added to the grower standard in comparison to the grower standard only. Average berry weight varied between 1 – 3% more with the addition of ColourUp and Sugar Express® at the three locations. According to the SA Department of Agriculture, Forestry and Fisheries the average blue berry income per hectare is ± R 800 000.

Deducting and average input cost of R 443 000 calculates to an average profit of R 357 000 per hectare. Based on the data from these commercial trials an extra yield of 300 kg and more per hectare surely appears worthwhile. Looking back on these trials there is enough motivation and evidence to further fine tune the applications of ColourUp and Sugar Express on blue berries in commercial trials to come. One is also looking forward to the results from a similar ongoing trial being conducted in the Limpopo Province of South Africa.

Should you require further information regarding the use of these products during blue berry production contact your nearest Hygrotech branch or Herman Walters (hermanw@hygrotech.co.za) or Charl Kotze (charl.kotze@hygrotech.co.za).

VISIT TO MILLER® USA

By Johann van der Vyver: Miller® Technical Sales Director – African Region

In August 2019 Antonie Jacobs (CEO of Zaad Holdings), Henry van der Voort (CEO of Hygrotech), Johann van der Vyver (Miller® Technical Sales Director – Africa Region) and Liezl van der Vyver (Miller® Contracted Regulatory Consultant – Southern Africa) visited Huber Head Office in Atlanta (USA). After the Atlanta visit Henry, Johann and Liezl visited Miller® clients in California with Octavio Magallanes (Miller® Sales Coordinator – California and Arizona).

Visiting table grape producers, Mr. Mark Hall (in the centre) and his son Carl (next to him) near Bakersfield in Kern County, California. Mr. Hall has been incorporating Miller® products for 30 years as part of his production practices. From left to right: Johann van der Vyver, Sal Ruedas (Miller®), Liezl van der Vyver, Octavio Magallanes and Henry van der Voort.

Zaad's (new owners of Hygrotech since October 2018) future vision with Hygrotech specifically in relation to the expansion of Miller® product sales and marketing footprint in Africa, was favourably received, especially the upgraded marketing structure and format of Hygrotech with regards to Miller® products in South Africa. Inspiring was Huber's reconfirmation to back development of additional Miller® products and expansion of current product applications in South Africa especially by means of research and development and regulatory procedures. This will increase the footprint of Miller® and its products in South Africa even more.

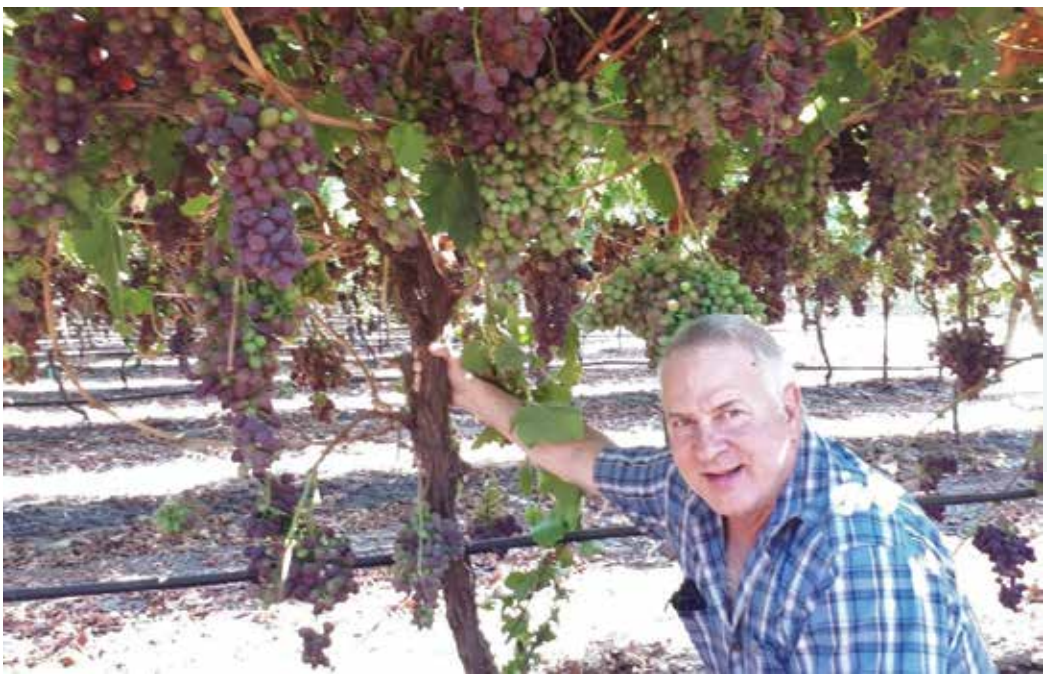
The visit to the Fresno and Kern Counties in California was surely an eye opener. Not just to witness the magnitude of fresh fruit (and other crop) production, but also to observe the Miller® range of products (adjuvants, nutrient orientated products and the patented Express Technology®) being incorporated with other Good Agricultural Practices. These included producers of almonds, maize, nectarines, peaches, pistachio and table grapes. The pictures displayed are from some of the field visits.

During the visit to Mr. Hall the bunch-load (indicated in bottom picture) on the vines was impressive. Despite the load, we were impressed with the overall condition of the vines. The vines had no disease symptoms and appeared to still have a lot of energy available: no signs of physiological leaf senescence, while new growth was still ongoing (top picture).

A maize (corn) field in the Fresno County dwarfing Johann, Liezl and Henry. The healthy condition and energetic growth appearance proclaim the benefits of Miller® products within a production programme.

Looking at the fruit load on these almond trees, one can understand why Octavio is so proud of this Miller® fertilizer programme.

The fruit load, quality and size of these peaches from a grower in the Fresno County using Miller® products during production were a feast for the eyes and taste buds.



At another table grape producer that uses the Miller® products, Henry was impressed with the number of bunches AND also thickness of the main stem, only 9 months after being planted.

Sporekill®

DISINFECTANT AEROSOL FOGGER

(Reg no. ACT5GNR529/243642/040/1199)

ICA International Chemicals contact details: +27-21-886-9812 | www.icaonline.co.za

A DISINFECTANT AEROSOL BREAKTHROUGH TO KILL HARMFULL AND UNWANTED MICROORGANISM

Building on the internationally tried and tested efficacy of **Sporekill®** registered as fungicide & bactericide in crop protection (SA Reg. no. L7115 (Act 36 of 1947) and as a broad spectrum disinfectant of pathogenic micro-organisms (SA Reg no. Act29GNR/27555/070/210), this new user-friendly **Sporekill® Disinfectant Aerosol Fogger** will greatly assist in controlling of harmful microorganisms, wherever they occur, even in difficult to reach areas. **Sporekill®** also comply with SANS 1853 (Disinfectants and detergents for use in the food industry). **Sporekill®** is known to be highly effective against a wide range of bacterial & fungal plant pathogens and pathogens compromising human & animal food safety, some listed below:

Plant pathogens genera:

Acidovorax, Acremonium, Alternaria, Aspergillus, Botrytis, Cladosprorium, Clavibacter, Colletotrichum, Erwinia, Erysiphe, Fusarium, Galactomyces, Geotrichum, Hyaloperonospora, Leveilulla, Monilinia, Mucor, Mycosphaerella, Pectobacterium, Penicillium, Phaeoacremonium, Phaeomoniella, Phomopsis, Phylosticta, Phytophthora, Pseudomonas, Pythium, Phoma, Ralstonia, Rhizoctonia, Sclerotium, Sclerotinia, Sphaerotheca, Streptomyces, Taphrina, Uromyces, Verticillium, Xanthomonas, Xylophilus.

Pathogenic microbial genera that compromizes animal & human safety:

Acinetobacter, Aspergillus, Bacillus, Candida, Clostridium, E. coli, Klebsiella, Lactobacillus, Micrococcus, Proteus, Penicillium, Pseudomonas, Saccharomyces, Salmonella, Shigella, Staphylococcus, Streptococcus, Trichophyton, Vibrio.

WHAT IS SPOREKILL® DISINFECTANT AEROSOL FOGGER

Sporekill® Disinfectant Aerosol Fogger is a ready-to-use specialized formulation of the highly effective disinfectant **Sporekill®** in a pressurised can, which, once triggered will completely empty, resulting in a very fine aerosol mist to disinfect any closed area of approximately 35 m^3 per aerosol can. Examples of such closed areas in the agricultural industry include (but not limited to) the following after the area is cleared from any food stuff, animals & humans:

- inside of trucks transporting food stuff
- cold rooms
- fruit & vegetable & food packing facilities
- fruit & vegetable degreening & ripping rooms
- storage & sample rooms
- germination chambers
- misting & growing chambers
- greenhouses
- transport containers
- laboratories & sporulation chambers
- food processing areas
- BA & CA storage room for pome fruit
- many more.

ADVANTAGES OF SPOREKILL® DISINFECTANT AEROSOL FOGGER

- Been tested and found to be very effective against wide range of pathogenic & unwanted micro-organisms compromising food safety and pre- and post-harvest plant diseases
- Non-corrosive to various metals, plastics, rubber and other surfaces
- Been proven to be less prone to the development of resistance than other disinfectants
- Shown a strong residual effect against microbial pathogens on hard surfaces
- Been shown to kill certain pathogens with only as little as 10 second contact time

EFFICACY TESTS OF SPOREKILL® DISINFECTANT AEROSOL FOGGER

TRIAL 1: DEPT OF MICROBIOLOGY & BIOCHEMISTRY, UNIVERSITY OF THE FREE STATE

In independent laboratory tests, the efficacy of **Sporekill® Disinfectant Aerosol Fogger** has been demonstrated at low temperatures (cold room) and at high temperatures (incubator at 37°C). High levels of efficacy were experienced under both conditions (Fig 1 and Fig 2). Very limited bacterial growth was seen on the disinfected surfaces even after 5 days, illustrating residual activity.

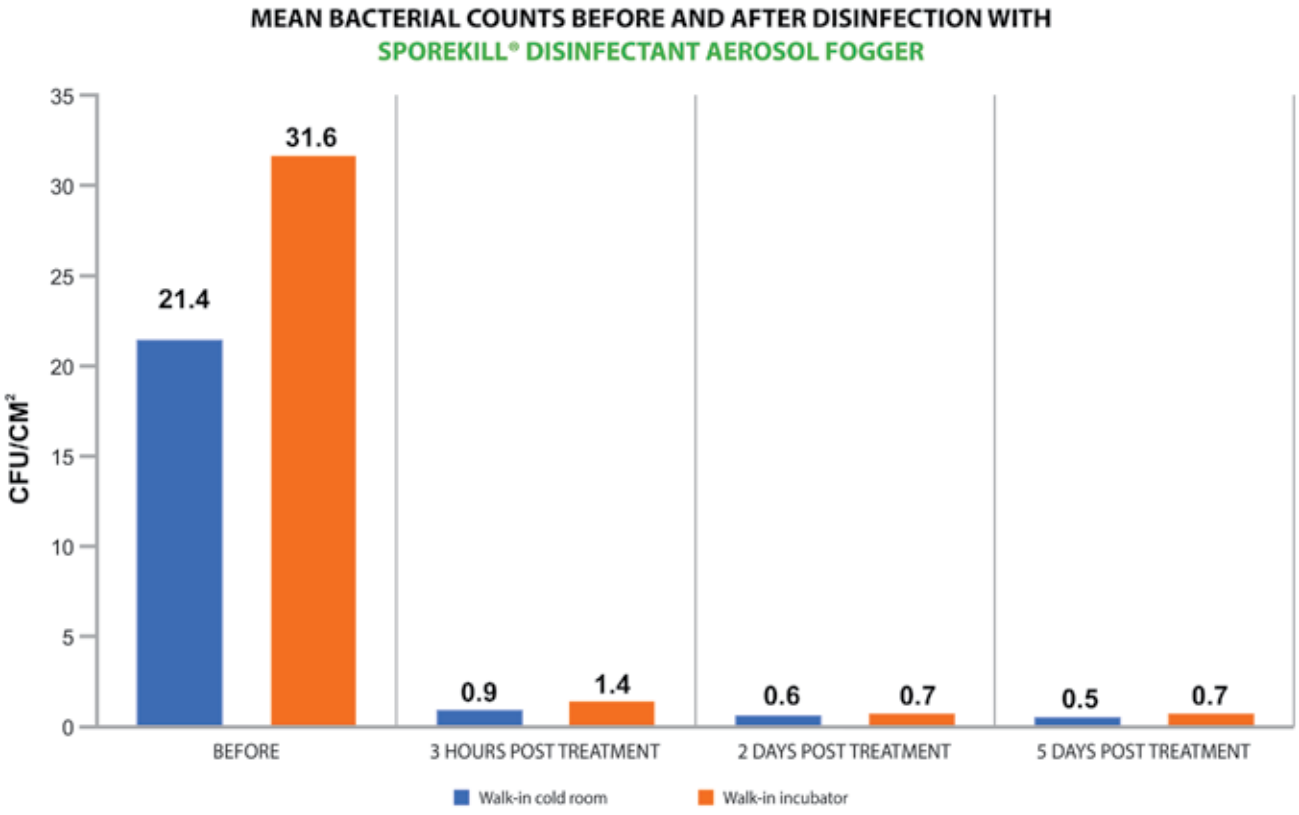


Figure 1: Bacterial counts before and after disinfection with the Sporekill® Disinfectant Aerosol Fogger in a cold room and incubator.

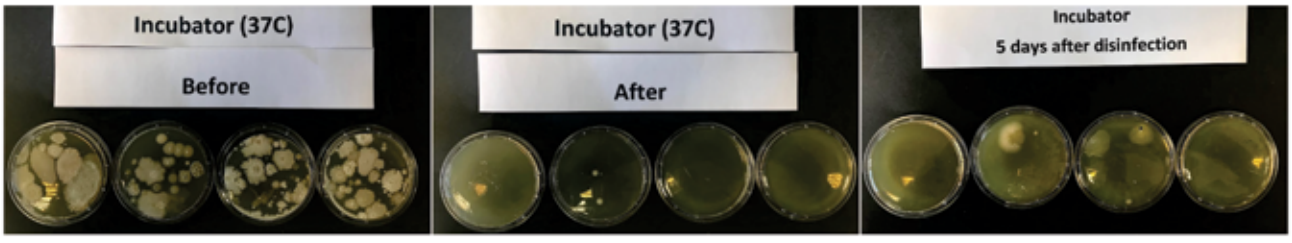
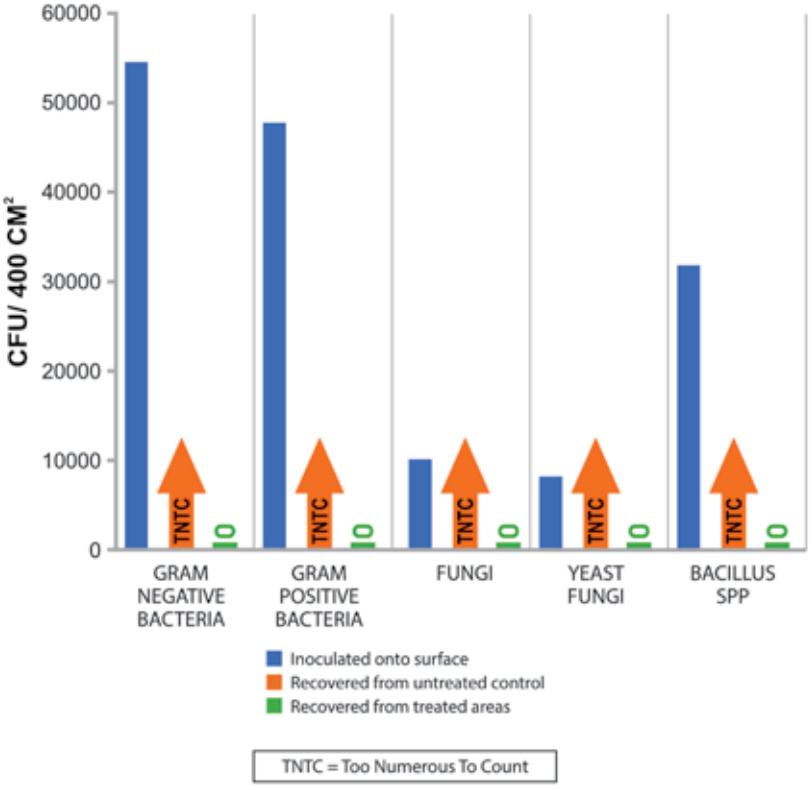


Figure 2: Example of contact plates collected before and after treatment with the Sporekill® Disinfectant Aerosol Fogger.

TRIAL 2: INDEPENDENT SANAS ACCREDITED LABORATORY

Efficacy trials by independent testing laboratory were conducted inside controlled sealed chambers (Chamber = Length 3.3 m x With 2.4 m x Hight 2.6 m). Seven pathogen species which include Gram positive bacteria, Gram negative bacteria, fungi, yeast and hard to kill *Bacillus subtilis* spores were inoculated onto tiles and placed around the chamber. One 500 ml **Sporekill® Disinfectant Aerosol Fogger** was released in the treated chamber while the control chamber was not subjected to the test product. After prescribed contact periods (5 min for bacteria, 15 minutes for fungi & yeast and 1 hour for Bacillus spores), agar contact plates were brought into contact with each inoculated tile surface to determine the killing rate. A total of 25 contact plates per pathogenic organism were used which calculated to a total of 400 cm^2 agar plate surface. All contact plates from the **Sporekill® Disinfectant Aerosol Fogger** treated chamber and untreated control chamber were incubated at 30°C for 48 hours to determine the % killing rate.

EFFICACY OF
SPOREKILL® DISINFECTANT AEROSOL FOGGER
ON SURFACE SANITATION



DIRECTIONS FOR USE

USE ONLY AS DIRECTED

1. Shake container before use.
2. Remove humans/animals/produce/plants/feedstuff and fodder from space to be treated.
3. Highly flammable: Put off all electronics and extinguish all flames before use.
4. Protect food utensils and packaging materials from direct exposure (cover with paper/plastic sheet).
5. Pre-clean dirty surfaces with an appropriate detergent, rinse and dry. Efficacy of disinfectant will be compromised if surfaces are soiled.
6. Place the canister on a solid surface in centre of area to be treated, or evenly distribute canisters if more than one is required, open cupboards, close all windows and doors, seal any openings. **Sporekill® Disinfectant Aerosol Fogger** can be placed on a raised surface if area is higher than 4 m.
7. Activate the **Sporekill® Disinfectant Aerosol Fogger** and leave the area immediately.
8. Allow 60 min for the aerosol to disperse and settle before re-entry.
9. Re-introduce fruit/vegetable/plants only after fumes have cleared.
10. Thoroughly rinse or wash treated linen and clothing that will have skin contact during use, to remove disinfectant residues.
11. One canister will disinfect ~35 m^3 from fungi and bacteria, including spores.

ICA INTERNATIONAL CHEMICALS

Sporekill® Disinfectant Aerosol Fogger
(Didecyldimethylammonium chloride: 0.88 %).
Reg no. ACT5GNR529/243642/040/1199

ICA International Chemicals (Pty) Ltd. | Reg. No: 2001/013319/07
Tel: +27-21-886-9812 | www.icaonline.co.za | 28 Planken Street,
Plankenbrug Industrial, Stellenbosch, 7600, South Africa.

LAWN CARE

GREEN-UP

PRESCRIPTION MIXTURE

Fertilizer Group 1

5kg

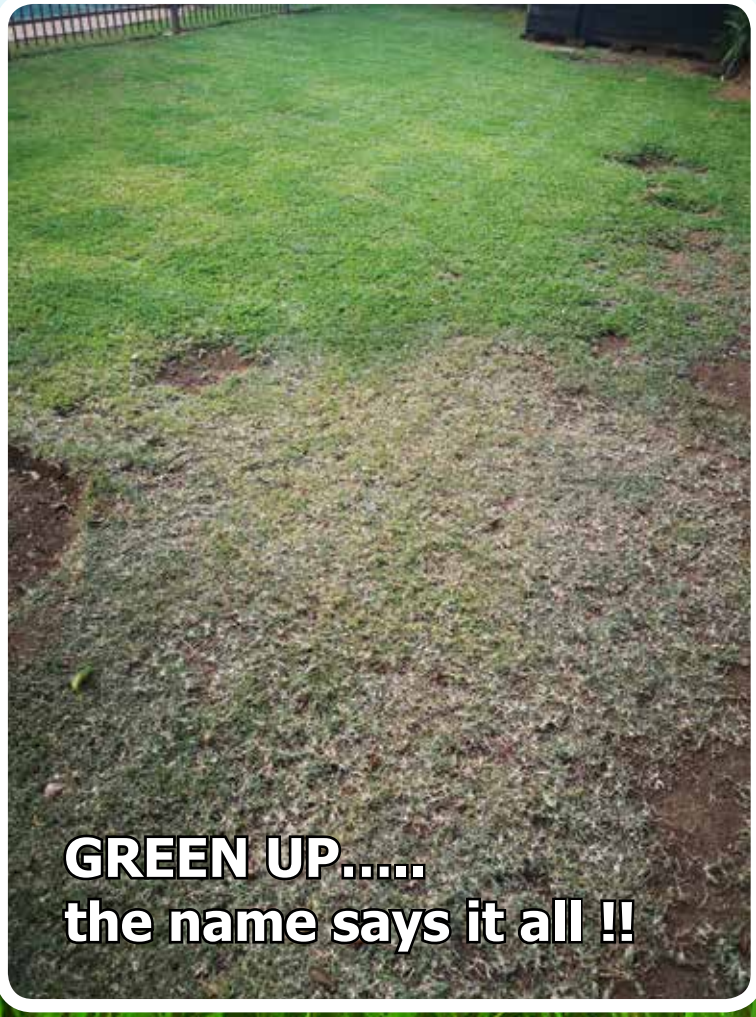
DIRECTIONS FOR USE

- Dissolve 2.5-5 kg of the mixture in 50-600 L of water according to method of application.
- Stir until it is dissolved and apply as a full cover spray on 1 ha of **turf grass** during the summer months to enhance photosynthesis.
- Use the mixture also at 5 kg/ha in irrigation systems on **turf grass** to enhance good growth and colour.
- Apply as foliar feeding just after mowing. Sprayed area should be irrigated thoroughly immediately after application.
- The mixture is compatible with fungicides and insecticides, except those containing copper, sulphur and alkaline materials.
- Use a suitable sticker-spreader such as Nu-Film P® (L2980 Act 36 of 1947) or Nu-Film 17® (L2981 Act 36 of 1947).

INGREDIENTS			
Nitrogen	(N)	84	g/kg
Magnesium	(M)	18.8	g/kg
Sulphur	(S)	199.71	g/kg
Ferric	(Fe)	78	g/kg

REAL VISUAL PROOF!

In the photograph right, the result - after only one week ! - of spraying **GREEN UP** on a portion of the lawn versus an unsprayed portion at the bottom, is clearly visible and significant.



(Photo supplied by my colleague Almari van Wyk of their lawn at home)

Contact Theo Schoonraad for more information - 083 273 2624

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PER BAG
VAT excl.
EX DEPOT

BUY ONE BAG HL 10 LUCERNE AND RECEIVE 25 KG HYPERFEED FREE

HYPERFEED

- Ideal combination of macro and micro elements for lucerne
- N-164 g/kg; P-55 g/kg; K-274 g/kg;
- Improves colour and vigor
- Spray at 5-10kg / ha, 10-14 days after each cutting for optimal results

HL 10
IS KNOWN FOR:

- Highest yield;
  <20 tons dm / ha / year
- Top quality hay;
  High leaf to stem ratio
- Excellent disease resistance
- No inoculation required
- Treated with Nitrocoat (Rhizobium)

FREE PRODUCT TO THE VALUE OF R 699.00!

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VALID FOR **FEBRUARY 2020** SHIPMENT (While stocks last)*

HYGROTECH
SUSTAINABLE SOLUTIONS

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SUMMER PASTURE WEED CONTROL

As a stock farmer, what would one consider to be the most valuable implement in cultivating pastures? Surely the planter. Or what about the fertilizer spreader? The baler perhaps? Boom sprayer ought to be the answer.

Why you may ask? Yes, other implements are in their own right crucial for the successful establishment and harvesting of pastures. The sprayer though, is the only implement that has a direct impact on every facet of pasture production; establishment, longevity, crop quality and yield. A well-maintained sprayer can be the most effective tool in a farmer's arsenal when cultivating, establishing and maintaining any forage or pasture crop, when used with a well planned and executed spraying programme. Farmers can greatly reduce weed competition which will result in better establishment, efficient use of fertilizer, less competition in field for healthier and longer-lived crops, all which will ultimately result in higher quality feed and improved yields. Here is how your boom sprayer can be implemented when next establishing or maintaining your pastures.

Pre plant/pre cultivation:
Most farmers opt to break new fields with fire and/or ground engaging implements. However chemical control before cultivating should be considered. It has been shown that burning can in some cases stimulate germination of certain weed seeds. Whilst mechanical practices may not effectively control some weed populations, and may even help spread the weed throughout the field as in the case with couch grass. Chemical control before cultivation can therefore, in most cases, not only help reduce weed populations after cultivation it can also greatly reduce cultivation cost and time. Another benefit of chemical control before cultivation is that organic material is retained on the field as compared to burning. The material which has been killed off is also significantly easier to incorporate and degradation times are also greatly reduced when compared to green/growing plant material that has to be incorporated.

Chemical control pre plant also has many benefits compared to mechanical control. The most important and often forgotten is the retention of soil moisture as the soil does not have to be disturbed as often as with mechanical control measures. This will inevitably lead to other savings such as diesel, labour and cultivating time. There are two modes of action that can be utilized pre plant/cultivation. Burn off with the aid of herbicides such as paraquat (ie. FARMAG PARAQUAT 200. Reg. no. L9059 of Act 36 of 1947) which as stated burns all active growing weeds. Paraquat is therefore best used pre cultivation.

When selecting a herbicide for pre planting, herbicides containing glyphosate (ie. PIRAHNA 510 SL. Reg. no. L9314 of Act36 of 1947) is a first choice. Glyphosate can be applied directly in front of the planter with no risk to the seed or germinating seedlings. When applying these herbicides be sure to follow label recommendations especially in the case of glyphosate where certain adjuvants are essential. Adjuvants such as ammonium sulphate (i.e. ASSITANCE Reg. no. L8015 of Act 36 of 1947) is often a requirement to bind antagonistic elements when making glyphosate tank mixes. Other adjuvants such as stickers (i.e. NU-FILM® P. Reg. no. L2980 of Act 36 of 1947) or activator enhancers (i.e. ENTREE. Reg. no. L8055 of Act 36 of 1947) can assist in increasing efficacy of both actives by adhering the active to the leaf surface and improving uptake and translocation through the weed.

Pre plant/pre emergence:
Various products are registered for the control of certain weeds that must be applied before planting and before weed emergence. However, such applications are not common practice when establishing forage and pasture crops. If you feel your operation can benefit from such an application speak to your local chemical marketing representative for a recommendation.

Post emergence:
Once the crop has established (usually 4-8 weeks post seeding) is where the fun really starts and where most issues regarding weed control start and persist. Broadleaf weeds in grass or grass type forages such as sorghum or millet is relatively easy to eradicate. These are easily controlled with 2,4 D (i.e. FARMAG 2,4 D AMINE 480. Reg. no. L6716 of Act 36 of 1947). Keep in mind that 2,4 D has very specific application times and dosage rates. Other actives which also control broadleaf weeds in grasses can either be used in isolation or in mixtures to improve efficacy. Actives such as Dicamba and MCPA are most commonly used in conjunction with 2,4 D. Your chemical advisor will be able to assist in this regard. The use of a drift retardant (i.e. MIST CONTROL®. Reg. no. L4567 of Act 36 of 1947) which, amongst other, is an obligated practice in the USA with hormonal herbicides can be advantageous.

Keep in mind that some broadleaf weeds tend to be harder to control mostly due to the leaf surface. Some are very waxy and others again might have a thick covering of fine hairs, resulting in poor retention or uptake of the herbicide. Therefore, the addition of Entrée is essential to accommodate the variety of leaf surfaces among various weeds. With waxy leaf types such as Purslane (Porslyn / Varkkos) or smooth leaf types, Datura (Thorny apple, Olie

boom) and Entrée will reduce bounce/run off. With hairy weeds such as Conyza (Skraalhans) ENTRÉE will assist with herbicide deposition and spreading on (among) the hairy leaf surface.

Grasses within grasses can only be controlled mechanically or by means of spot spraying, both of which are not viable in larger fields. In this case it is therefore essential to start with a clean field when seeding. Where grass pastures are to be established, it is beneficial to cultivate a broadleaf crop for one or two seasons so that grasses can be weeded out by chemical control measures.
When cultivating broadleaf crops such as Cow Pea, Sunhemp, Lucerne etc weed control becomes a whole lot more complex. Grasses as a rule are harder to control. However, there are many active ingredients on the market for the control of grasses in broadleaf crops. If applied effectively, good control can be expected. Herbicides known as FOPs and DIMs (i.e. Propaquizafop or Sethoxydim) are most regularly used. Broadleaf weeds can also be controlled with relative ease despite being found in broadleaf crops. Actives such as Imazamox is widely used in Lucerne as an example. Paraquat and Bromoxinil can also be used, but very specific application guidelines are to be followed. Many a field of Lucerne has been wiped out along with the broadleaf weeds due to incorrect applications.

OTHER WEED CONTROL MEASURES:
Herbicides for the control of specific weeds are also available. Halosulfuron (i.e. BRIGADIER 750 WG. Reg. no. L9218 of Act 36 of 1947) is probably the most well-known due to its effective control of yellow nutsedge in a variety of crops. Metsulfuron methyl is another herbicide which is used for the control of weeds such as Bankrupt bush, pom-pom weed as well as other woody and herbaceous weeds in pastures. When targeting a specific weed also have a close look and determine which adjuvant would be beneficial to the spray tank mixture. As an example, a sticker (like Nu-Film® P) would greatly increase your chances of successful control with regard to these two weeds. This is due to the limited leaf areas of the Bankrupt bush and Nu-Film® P's ability to allow for maximum absorption time. Entrée on the other hand will assist leaf coverage among the hairy surface on the pom-pom weed and facilitate rapid absorption of the herbicide. Along with these herbicides there are other actives that can be used in day to day operations to tackle other common challenges. Bromacil is effectively used in the clearing of line fences. Due to its extended working period it is ideally suited to areas that are to be kept clean for extended/indefinite periods of time. Bromacil is mostly used to clear away weeds, grasses and even trees and shrubs along fences or around sheds. Bromacil is known to leach at a very low rate. However, adjuvants such as Sustain® (Reg. no. L7690 of Act 36 of 1947) can further assist with reducing the leaching potential and other environmental factors.

Picloram can be used for the control of various tree and herbaceous weeds and is widely used in the control of Lantana in extensive grazing operations.

Glyphosate should always be kept on hand in any farming operation for its non-selective control of weeds. Glyphosate can be used in clearing roads, walkways, fences, firebreaks etc. And the list goes on. Despite having access to these herbicides, a producer should always keep in mind that any active is only as effective as in the manner it is deposited on the target.

When making a spray tank mix for any spray solution the following questions have to be answered with a resounding yes to ensure proper control of target weed populations along with reducing the risk to the crop.

1. **Is the spray tank mixture mixed and formulated correctly?** (always refer to and strictly adhere to the rate, mixing and application guidelines as mentioned on product labels).
2. **Will adequate levels of the active reach the target?** (reduce drift with the addition of a drift reduction product (i.e. MIST CONTROL®).
3. **Will the active hit the target?** (some actives work through the soil whereas others need to be taken up through the leaf. Be sure that the active reaches the intended target. Deposition aids (ie, ENTRÉE or SUSTAIN) can benefit the active depending on the intended target).
4. **Will the active stay on target?** (adhesion through the use of a sticker (ie. NU FILM P®) will keep the active on target for longer and improve uptake should extended absorption time be require and/ or if adverse weather conditions are expected after the application)

For more info on these and other actives and adjuvants that can be used in your farming operation, feel free to contact your nearest Hygrotech branch or be sure to contact your local chemical representative for area specific recommendations.

We would like to extend our thanks to Cameron Miller (Commercial Manager; Farmag) and Johan van der Vyver (Technical Sales Director: Africa region; Miller® Chemical & Fertilizer, LLC) for their assistance in the writing of this article.

**Note all information is rendered for informative purposes only. Hygrotech nor the contributors can be held liable for the incorrect interpretation, relay or use of the information herein. Always refer and adhere to information on product labels when using them.*

DLF SEEDS

The DLF group has a global footprint with breeding programmes across Europe, the USA and New Zealand. The highly skilled breeders in charge of these breeding programmes focuses on finding solutions to climatic challenges, disease and forage quality, without compromising any productivity.

DLF Seeds South Africa has been tasked with selecting varieties from this giant pool, well adapted to the challenging conditions of Southern Africa. The South African evaluation programme consists of a primary site, located in the Langkloof area of the Eastern Cape Province.

The extreme conditions highlight varieties that are adapted to areas experiencing drought and heat challenges. In addition to the Langkloof site, there are also trials at Cedara Research farm in KwaZulu-Natal Province. DLF also takes part in the National Elite variety trials at Outeniqua- and Cedara Research Farms. The different conditions these varieties are exposed to gives an excellent overview and expectation for varieties when they enter the commercial phase.

In March 2018 DLF established its first screening trial consisting of 149 varieties, including Perennial ryegrass, Italian ryegrass, Westerwold ryegrass, Tall fescue, Cocksfoot and Festololiums. These trials were a huge success and our clients are already reaping the benefits.

DATA

Tugela, the latest release from DLF New Zealand, is a diploid perennial ryegrass. Even in the extreme summer conditions of the Langkloof, Tugela's stand survival was excellent. This is likely attributed to Tugela's exceptional tiller density. It has a typical fine leaf and is densely tufted. Tugela has a late heading date and exceptional early spring growth.

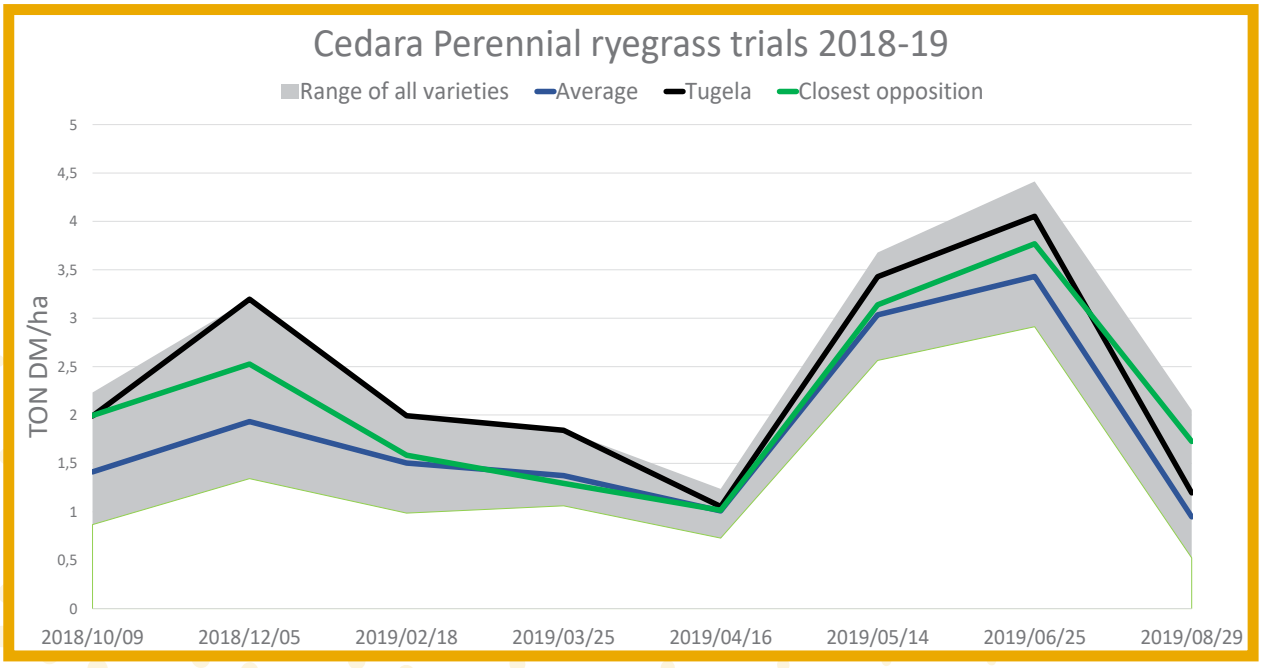
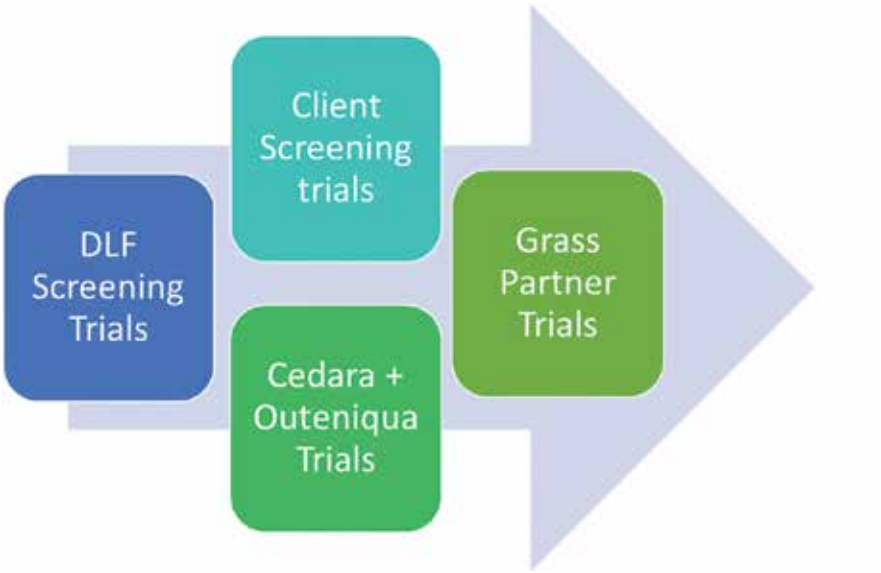


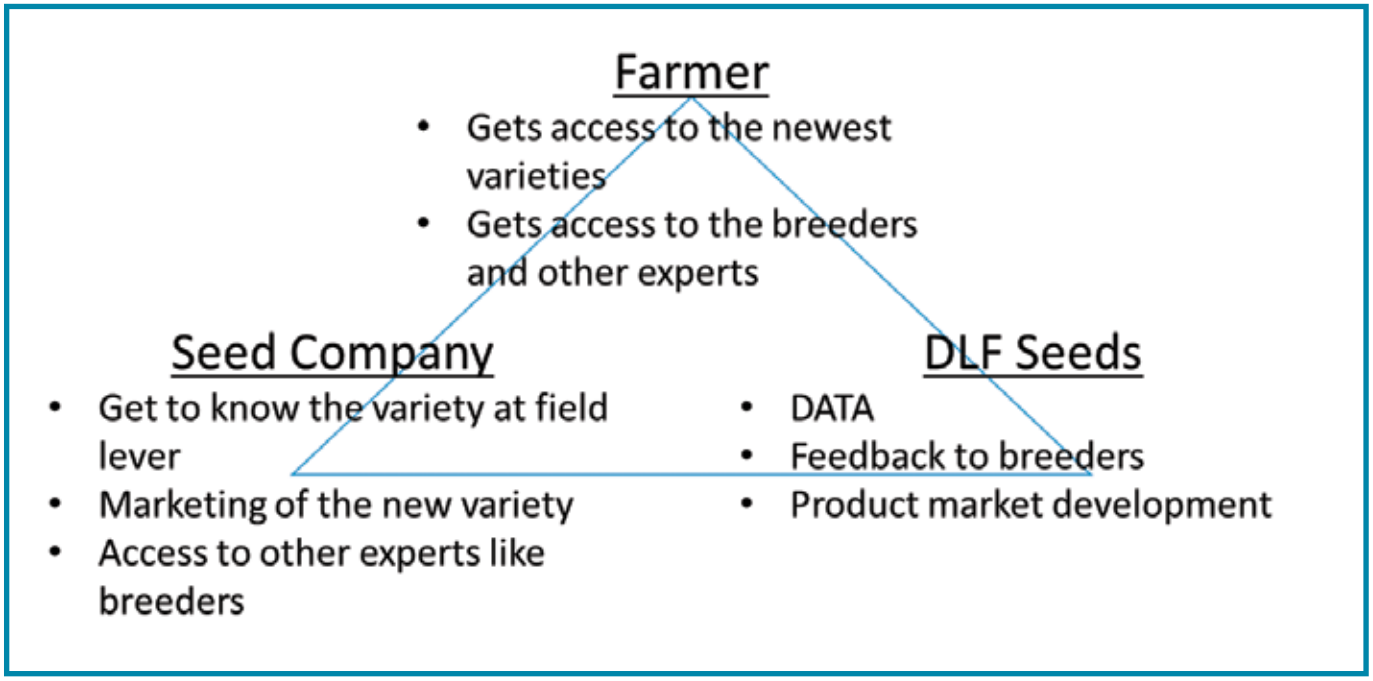
Figure 1: Tugela Perennial ryegrass planted on 17 April 2018 at Cedara Research Farm in KwaZulu Natal. Tugela indicated by the black line were well above the other varieties for most of the year.

The grey zone *– Area including all data points of all the varieties included in the trial over the growing period.*

Other than looking just at the total production or the average production, the grey zone gives an idea of the seasonal potential and the strengths of the individual variety compared with the other varieties in the trials.



DLF Seeds South Africa sources seed from around the world within the DLF group. The competitive advantage lies in the fact that DLF can select the best genetics and technology through local evaluation, choose the most cost-effective seed production sites around the world, and distribute best performing varieties at competitive price levels. It places DLF South Africa in the perfect position to build strong product portfolios for the distributors. The genetic source in the group is also large enough to make varieties available on an exclusive basis to seed companies in South Africa.



DLF pride itself on technical marketing and placing great emphasis on product training. DLF recently introduced the Grass Partner Concept. Here the aim is to trial the latest varieties on farm level by involving the farmer, the seed company and DLF. The varieties are subjected to specific farming systems and are managed accordingly. The farmers are encouraged to take rising plate measurements on a regular basis and to document any special observations throughout the season, whereas the seed company and DLF will provide technical support and regular visits to the farm. A successful grass partner project will generate valuable data used in marketing, a venue for training agents and a satisfied client.

To provide farmers with the best possible forage solution to their unique environments, it is important for DLF to be on the forefront of new technology and to keep investing in research.

-The DLF Team

IMPACT ITALIAN RYEGRASS

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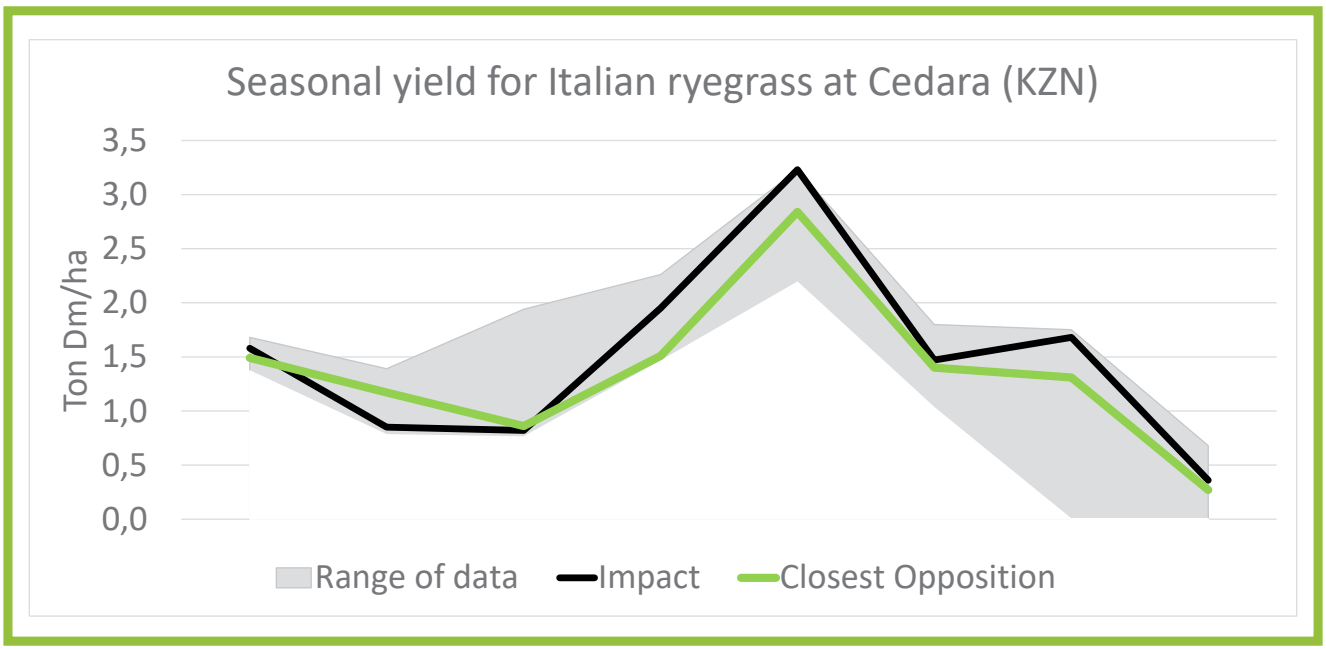

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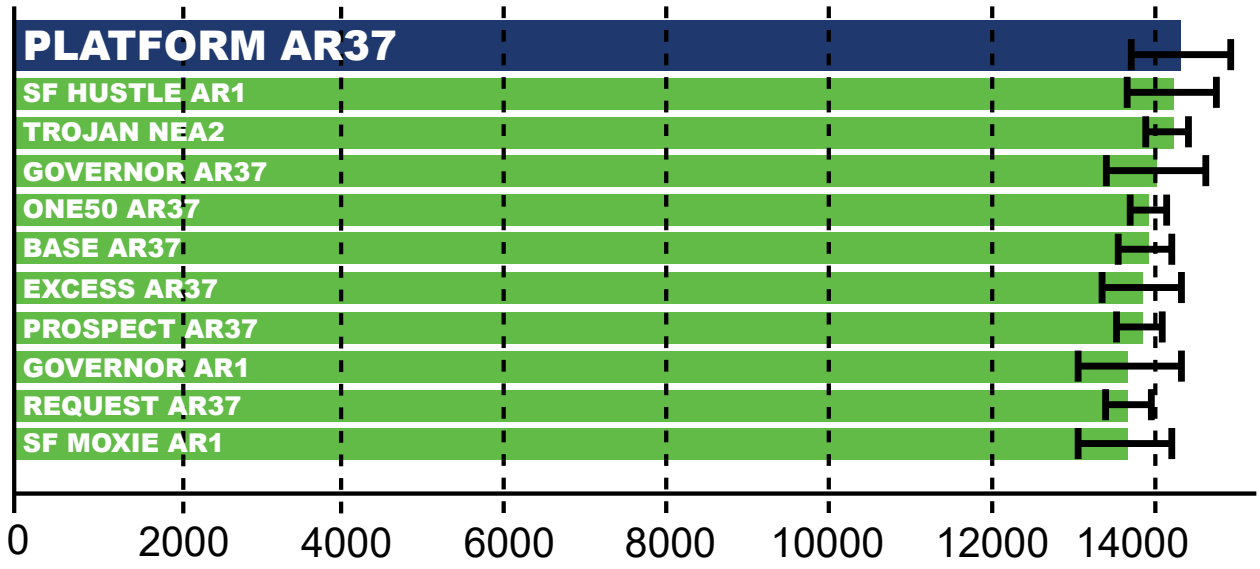

NFVT Summary 1991 - 2018 (August 2018)*

Full results available at https://www.nzpbra.org/forage-trials/results/

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PGG Wrightson Seeds

PSHB Beetle

- the threat is real…

(Polyphagous Shot Hole Borer)

PSHB

The polyphagous shot hole borer (PSHB), *Euwallacea whitfordiodendrus* (Schedl) (previously referred to as *Euwallacea* nr. *fornicatus* sp. No. 1 Eichhoff; O'Donnell et al. 2015), was first collected in 2003 in the region (Rabaglia et al. 2006; Seybold et al. 2016; Gomez et al. 2018b) but gained considerable attention when injury symptoms were first detected in 2012 on ornamental Avocado trees, Persea Americana Mill., in Los Angeles County (Eskalen et al. 2012).

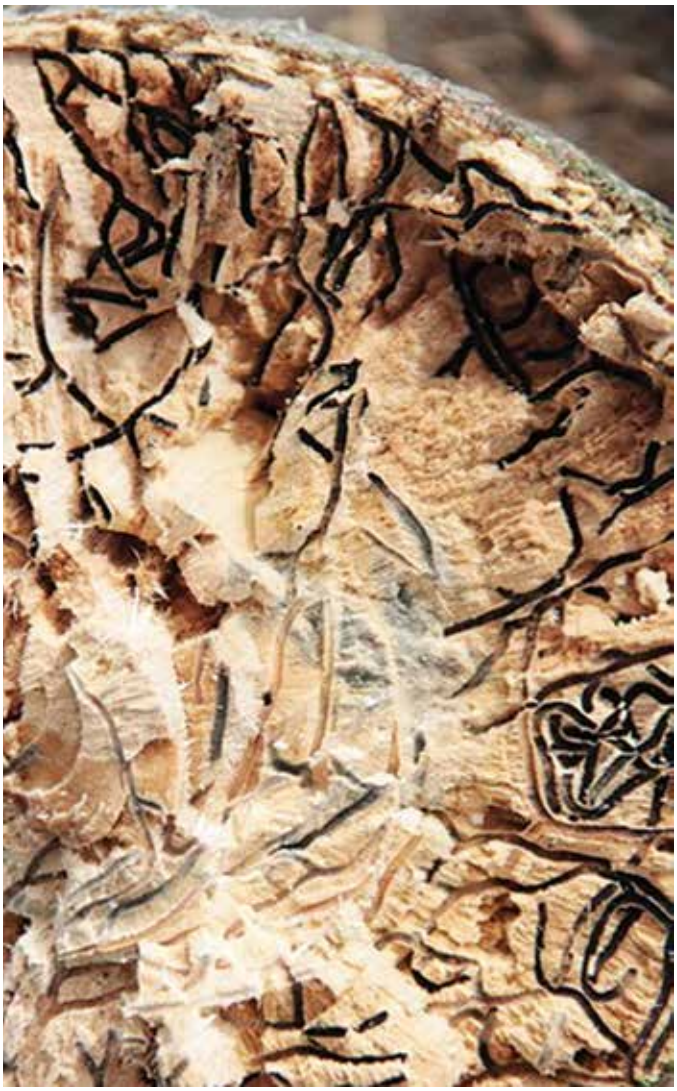

Figure 1: Tunnels that are formed within the bark, with the fungus (visible in the centre of the pictures.

PSHB native to Southeast Asia, was identified initially in California as the tea shot hole borer (TSHB), *Euwallacea fornicates.*

In 2017, the Polyphagous Shot Hole Borer was detected on London Plane trees in the KwaZulu-Natal National Botanical Gardens in Pietermaritzburg. The PSHB infestation in South Africa has reached Johannesburg, Durban, Richard's Bay, Pietermaritzburg, George, Knysna and Hartswater. Johannesburg, with its dense urban forest, has been hit particularly hard.

This beetle is associated with three symbiotic fungi, ***Fusarium euwallaceae*** (S. Freeman, Z. Mendel, T. Aoki & O'Donnell), ***Graphium euwallaceae*** Lynch et al.; and ***Paracremonium pembeum*** Lynch et al. have been isolated from the mycangia of PSHB and from infected wood (Eskalen et al. 2013; Lynch et al. 2016). Among these fungal species, ***Fusarium euwallaceae*** was recovered at higher frequencies from the mycangia of PSHB and was the most prominent fungus found in the xylem of attacked trees (Cooperband et al. 2016; Lynch et al. 2016). The fungus serves as a food source for the adults and their larvae. Eskalen et al. (2012) referred to tree injury associated with PSHB and this fungus as **"Fusarium die-back."**

The beetles can attack a wide range of living exotic and indigenous trees. In susceptible trees the fungus slowly kills the tree. Firstly, the tree's vascular system begins to fail, leaves begin to thin on the ends of the branches, eventually turning brown, spreading to the branch and eventually the tree will die.

21 tree species have been identified as "Reproductive Hosts" within South Africa and evidence of PSHB has been found in 151 trees species within South Africa. Host trees can be defined as either reproductive host trees or non-reproductive host trees. Reproductive host trees are trees where the PSHB can successfully reproduce, and which eventually die due to the fungus. Non-reproductive host trees are attacked by the beetle, but PSHB reproduction is not successful. The fungus might or might not disease and eventually kill these trees.

Reproductive Hosts:

- Australian Blackwood *(Acacia melanoxylon)*
- Avocado *(Persea americana)*
- Black wattle *(Acacia mearnsii)*
- Boxelder *(Acer negundo)*
- Castor bean *(Ricinus communis)*

- Chinese maple *(Acer buergerianum)*
- English Oak *(Quercus robur)*
- Honey locust *(Gleditsia triacanthos)*
- Japanese maple *(Acer palmatum)*
- Liquidambar; American sweetgum *(Liquidambar styraciflua)*
- London Plane *(Platanus x acerifolia)*
- Pin oak *(Quercus palustris)*
- Pink flame *(Brachychiton discolor)*
- Southern magnolia *(Magnolia grandiflora)*

The beetle is vey hard to control due to conventional pesticides not being able to penetrate the bark quickly and efficiently. Contact insecticides may work if the beetle is sprayed whilst still outside the bark. Similarly, systemic fungicides could also be regarded as effective if it translocates quickly within the tree. Hygrotech however, has found an effective biological solution.

Figure 2: The Shot Hole Borer burrows into different trees in burrows smaller than a ballpoint pen tip. Your tree will not die quickly or easily. As the tiny PSHB beetle lives inside the wood it is unlikely to be noticed crawling on the bark.

Contact Hygrotech's Head Office in Pretoria, for more information. Tel 012 545 8000

Hope for brave farmers' wives

By Melani de Beer

It hasn't rained for months or years in certain areas of South Africa. Whirlwinds spinning across the Karoo plains, the remaining sheep are gathered in groups, with heads hanging... What was once successful farms are almost destroyed today…

Someone needed to build up these farmers and their wives. The "Boks vir 'n Boervrou" project, was launched by two women from the Wellington VLV, a story that has gripped the country and brought a touch of hope to women in theses drought-stricken areas.

The country is undergoing some of the worst droughts in 100 years and there are heart-breaking stories daily of people and animals that are suffering in this terrible ordeal.

The idea of this box is to lift the spirit of these women by assuring them that someone cares. These boxes are wrapped in newspaper with a colourful ribbon filled with all kinds of treats, food and toiletries.

Hygrotech and staff members also opened their hearts and 30 boxes were donated to support this initiative. A nice gesture to show that we, being in the agricultural industry, support our farmers. Currently thousands of boxes are being distributed to these areas all over the country to at least give women hope whilst trying to keep their families together and positive. Well done!

Hygrotech and staff members also opened their hearts and 30 boxes were donated to support this initiative.

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SOUTH AFRICA

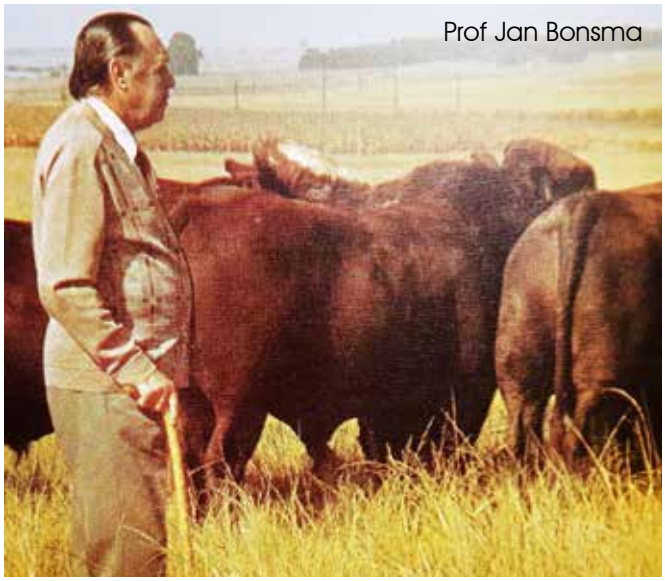
Man must measure

Famously quoted and the title of his infamous book, Prof Jan Bonsma was a legend before his time. The founding father of the Bonsmara, Prof Bonsma was known for his meticulous and unbiased measurement of the cattle he bred. A key factor that led to the now legendary success of the breed.

It was with this in mind, that Hygrotech's forage and pasture division has moved to expand on our current selection and screening trials. For many years, sucessful screening trials were run on a yearly basis at our George trial grounds. These trials were however focussed on our temperate grass and forage portfolio.

This spring we will be launching the first extensive screening and selection trial for replacement varieties on rye, oats, triticale, forage sorghum, lucerne, cover crops, sub-tropical grasses, forage radish, turnip and beet. We have sourced new material from countries such as Germany, New Zealand, South America and Australia among others. The trial will include no less than 30 new varieties with 20 check varieties form our own and opposition portfolios. From the trials we hope to identify possible replacements for current varieties as well as establish how well these varieties perform against top benchmark varieties in South Africa. The trial was planted on our Dewagensdrift trial farm 30 min North East of Pretoria on 5 November 2019.

We will be able to publish the first round of results in the next Forum.


Prof Jan Bonsma

COMMUNITY SUPPORT:

Hygrotech and Miller® sponsor Ben Vorster High School golf day

Ben Vorster High School in Tzaneen is one of the top schools in the Limpopo Province of South Africa. In order to fulfil its responsibilities as a public school to promote and develop its learners, facilities and terrain, funds are annually raised in addition to government subsidies. One such a fund raising event was the annual golf day that took place on 23 August 2019 at the Tzaneen Country Club. Hygrotech and Miller® made use of the opportunity to support the local community by sponsoring a "four ball" and the 18th green. Two of Hygrotech's clients, Mr Naas Loubscher from WD Seedlings and Mr. Piet Maritz "Patat" from Hoedspruit were invited to partake in the "four ball" with Fielies Nieuwoudt and Dirk le Roux from Hygrotech Tzaneen. The day was a success and enjoyed by all participants. The golf day sponsorship is in addition to another support by Hygrotech and Miller® to Ben Vorster High School by means of an annual advertising fee for displaying a bill board on the school's fence.

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The citrus industry in South Africa

Written by Charl Kotze, Michael Luttig and Lodewyk van Staden. Hygrotech - Nelspruit branch

Citrus originated from the sub-tropical and tropical regions of South East Asia, South East Asia Islands and North Eastern Australasia. Where through hybridization and introgression three ancestral species of citrus came to be; namely citron, orange mandarin and pomelo. It is speculated that Alexander the Great introduced citrus plants from Asia to Turkey, Greece and North Africa during the 4th century BC. Which lead to the cultivation and later distribution of the species through colonialism.

One of these colonial outposts was at the southern tip of Africa, where a Dutch navigator called Jan van Riebeeck established a halfway colony in 1652 to supply vessels and crew of the East Indian Company with fresh produce on journeys to the East. At the time scurvy was a major problem among sailors and was addressed through Vitamin C intake. Citrus being a major source of Vitamin C was identified as a crop to address the problem.

Therefore, in 1654 Van Riebeeck imported citrus plants from St Helena on a ship called the "Tulp". In the end 1162 orange and lemon trees were planted in the Company gardens in Kirstenbosch from which the first harvest was picked in 1666. The industry grew from there and the first exports occurred when 3000 crates were shipped to Belgium in 1907. Today exports are estimated to be in the region of 137 million cartons worldwide. With these volumes, South Africa is the 2nd largest exporter of citrus worldwide culminating in approximately 83 000 ha of plantings throughout nine different growing regions in South Africa. During the 2017/18 growing season citrus exports accumulated to R18 166 million making it South Africa's highest grossing agricultural export commodity and more importantly creating more than 100 000 jobs in the process.

Citrus types and plantings

Citrus types

All known commercial cultivars and varieties have their origin from the three ancestral species. Today they can be divided into four main citrus types known as sweet orange, grapefruit/pomelo, lemon/limes and soft citrus, of which each can be subdivided into cultivars and varieties. These came to be through selections, mutations and breeding, each with its own characteristics to be more attractive and competitive in the global export market. As big a role high quality fruit plays in this regard, as big is the timing factor of different varieties into markets. Table 1 illustrates the overall maturation tables of the different commercial citrus types. Each variety will have its own slot while climatic region will influence maturation as well.

Plantings

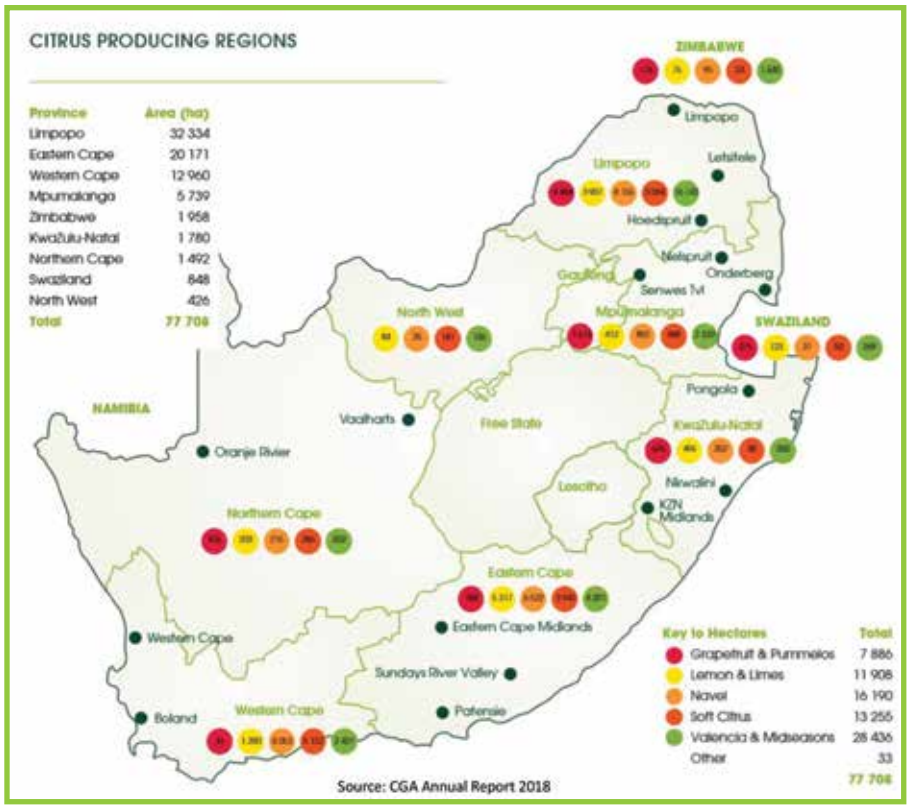
As of 2018 the Limpopo province consisted of 32 334 ha of citrus plantings (Figure 1) making it the province with the greatest citrus hectares followed by the Eastern Cape with 20 171 ha. Plantings in both provinces consist mainly of sweet oranges (Valencia, Mid-season and Navel oranges), combining to a total of 65% and 53% of Limpopo's and Eastern Cape's hectares respectively, while soft citrus on the other hand comprise 40% of the Western Cape's total of 12960 ha, showing that different citrus types are more adapted to certain climatic regions. Furthermore, all citrus scions are grafted onto rootstocks as most are susceptible to either soilborne pathogens (especially

Table 1. The combined maturation tables of the different citrus types for all the climatic

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sweet Orange					■	■	■	■	■			
Grapefruit/Pomelo				■	■	■						
Lemon/Limes		■	■	■	■	■	■	■	■			
Soft Citrus		■	■	■	■	■	■	■				

Source: Department of Agriculture, Forestry and Fisheries website

Figure 1. Planted hectares of different citrus types in each of the citrus producing areas of Southern Africa as of 2018.



Phytopthora and nematodes), soil composition or certain soil/water limitations. Rootstocks can influence the date of fruit maturity, internal and external fruit quality, yield, fruit size and the physiological characteristics of the fruit such as colour, rind characteristics (creasing, splitting and rind thickness) and sometimes even post-harvest quality. The more commercial rootstocks include the older Rough lemon, Cleopatra mandarin and Volckameriana as well as the newer Orange Trifoliate's and trifoliate hybrids (Carizo, Swingle, X639 etc) each with their own benefits and disadvantages. Therefore, rootstock and scion selection as well as the combination thereof remain an important part of citrus cultivation.

Challenges to the industry

Climate

As with many other agricultural sectors water availability remains a problem. The constraints on water sources are compounded by a higher export market demand due to an increase in citrus plantings to satisfy the said demand. Suggested by a growth of 8.5% from 2017-18 and 5.8% from 2018-19.

Phytosanitary pests

There are currently 3 regulated pests on the European Union list of phytosanitary pests, these include Citrus black spot (CBS), False coddling moth (FCM) and Fruit fly (All fruit flies foreign to Europe). With approximately 40% of exports destined to countries within the European Union, these pests could have a disastrous impact on South African exports. Therefore, all growers with ambitions to export there must comply with several regulations which was put in place by the Department of Agriculture Forestry and Fisheries (DAFF) in partnership with Citrus Research International (CRI). These regulations are in the form of management systems that was developed by the CRI and form an integral part of growers' pest control strategies. In the case of CBS this entails complete spray programmes that protect fruit for the entire period of susceptibility. Such a spray programme, labour and diesel included, could range anything between R8000 and R10000 /ha.

Biosecurity

This implies to all foreign pests of economic importance not yet found in South African citrus orchards. Each year a lot of money is spent by DAFF and CRI to identify these pests and to put action plans in place before they reach our borders. One such a pest is Asian Citrus Greening (HLB) that is vectored by the Asian Citrus Psyllid (ASP), the disease had a catastrophic effect on the citrus industry in Florida. One study by Neupane et al (2016) reported that production losses could be as high as 90-100% due to the disease. Through the work done by DAFF and CRI the vector has been identified in Kenya, while the disease has already established in Ethiopia.

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New Appointments
Chemical Advisors
FertAgChem Range

FRANCOIS FOURIE

New Chemical Advisor in the Hygrotech Group:

Eastern Free State and other Nominated InteliGro agents

Francois joined the Hygrotech family, 1 July 2019. He grew up in Bethlehem and matriculated in 2004. Francois worked for two Chemical distribution companies for the last couple of years in the Free State region before joining Hygrotech.Francois will service the Free State region, East of the N1, focusing on the Miller® Range of products.

FRANCOIS FOURIE

☎ **071 232 5695** ✉ **francois.fourie@hygrotech.co.za**

AREA: Eastern Free State and other Nominated InteliGro agents

DIRK MOOLMAN

DIRK MOOLMAN

☎ **084 208 6456** ✉ **dirk.moolman@hygrotech.co.za**

AREA: Western Free State and Northern Cape

New Chemical Advisor in the Hygrotech Group:

Western Free State and Northern Cape.

Dirk Moolman joined the Hygrotech family, 1 August 2019. Dirk grew up on a farm in the Northern Cape where they farmed with Cotton, Grapes, Lucerne and various row crops. He completed his MSC degree at the University of the Free State in 2011. Dirk will service the Bloemfontein and the Free State region, West of the N1 together with a portion of the Northern Cape region, focusing on the Miller® Range.

DIRK C COETZEE

DIRK C COETZEE (DC)

☎ **082 467 4867** ✉ **dirk.c.coetzee.2601@gmail.com**

AREA: North West Region

New Chemical Advisor in the Hygrotech Group:

North West Region

DC has extensive knowledge in Chemical distribution as he has been working in this sector for the past 25 years. DC joined the Hygrotech family, 1 August 2019. DC will service the Lichtenburg Chemical Distributors.

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New Appointments

ANNELIEN VERMAAK

Annelien was born in Uitenhage and has lived there all her life. She is married and has a 17 year old daughter. Annelien loves the out-doors, the sun and sea, camping and her dads' 'potjiekos'.

She recently joined Hygrotech as a branch clerk at our Uitenhage-branch, Eastern Cape.

EMILE DU PLESSIS

Emile ('Miela') matriculated in Mokopane or Potgietersrus, as it was known then. He farmed for 8 years in the Bushveld and is married to Natasha – they have a small little girl called Mianke.

Emile recently joined Hygrotech and will service the area from Dendron to Bela Bela and from Vaalwater to Groblersdal out of the Potgietersrus branch office.

☎ 062 6811 246 ✉ emile.duplessis@hygrotech.co.za

OFFICE: 015-491 2651

MARITZA PRETORIUS

Maritza joined Hygrotech at the Tom Burke branch, Limpopo as an office clerk on 1 July 2019. She is married to Johan and has a young daughter, Klara.

Maritza made an immediate impact at the branch which is now even more user friendly. Contact the branch at 082 903 0010.

MARIZA MEYER

Mariza grew up on a seed production farm between De Rust and Oudtshoorn, matriculated in Oudtshoorn and thereafter did various short courses in arts, crafts and restoration. She has a big interest in art, antiques, nature and photography...and loves horses.

Mariza recently joined Hygrotech as a branch clerk at our Vredendal-branch in the Western Cape.

STEPHEN PENNELLS

Stephen matriculated in Bloemfontein afterwhich he attended the University of the Free State where he obtained a B.Sc Agrig as well as a B.Sc Agrig (Hons) in plant pathology.He also obtained the AVCASA certificate and Fertilizer Advisor Training certificate with Fertasa.

He previously worked at Farmers Agri-care and most recently at Agrisol as an agronomist.Stephen recently joined Hygrotech and will be stationed at our Pietermaritzburg branch where he will look after product marketing / sales in a specific geographical area of KZN province. Stephen can be contacted on 071 1660 761

WELLNESS DAY A HUGE SUCCESS

Discovery Wellness offers interactive screening where key body metrics and blood tests are performed so that you can learn more about your health.

The screening consists of a number of assessments including glucose, cholesterol, blood pressure, postural assessment, eye assessment, weight, height, body mass index (BMI) and HIV.

On the 20th September 2019, more than 70 employees from Hygrotech head office took part in these screenings to find out about their current health and lifestyle risks. They also got advice about what is best to do about those risks and to take the necessary steps to BETTER HEALTH.

Well done to everybody who participated !

SPECIAL DAY CHRISTMAS BRAAI MENU

STARTER:
Baby Mielies with Smoked Butter, Chillies, Lemon and Garlic

INGREDIENTS
Two punnets of baby mielies, or 6 whole mielies cut into thirds

For the butter:
- 100 g salted butter, softened
- 100 g smoked butter, softened
- 2 red chillies, seeds removed, finely chopped
- the finely grated zest of a lemon
- a squeeze of lemon juice
- a big clove of garlic, peeled and finely chopped
- 4 Tbsp (60 ml) finely chopped fresh coriander
- salt and milled black pepper,

METHOD
1. For the dressing, combine all the ingredients, Season,
2. For the salad, preheat oven to 200 C, Place the butternut on a baking tray and drizzle with a splash of extra oil, honey and rosemary, Season, Bake for about 30 minutes, turning halfway, until golden,
3. Arrange the butternut (hot or at room temperature), cranberries, pomegranate (if using), feta, spinach and almonds into a Christmas tree shape, Serve with the dressing,

MEATY MAIN:
Marinated Lamb Chops

INGREDIENTS
- 1 tsp margarine
- 1/2 tsp lemon zest
- 2 tsp lemon juice
- 2 tsp fresh oregano - chopped
- 2 tsp garlic - minced
- 1/2 tsp salt
- pinch of pepper
- 8 lamb chops - trimmed of fat

METHOD
1. Melt the margarine over a low heat and add the lemon zest, lemon juice, oregano, garlic, salt and pepper, Mix well,
2. Pour into a sealable container and add the lamb chops, Seal the container and allow to marinate for 1 hour,
3. Grill or braai the chop for about 4 minutes per side (medium rare),

DESSERT:
Chocolate Brownie Pudding

INGREDIENTS
Ingredients
150g cake flour
5ml (1 tsp) baking powder
50g cocoa powder
50g salted butter
50g dark chocolate
225g sugar
2 eggs
5ml (1 tsp) vanilla extract
125m warm milk mixed with 15ml (1 tbsp) instant coffee

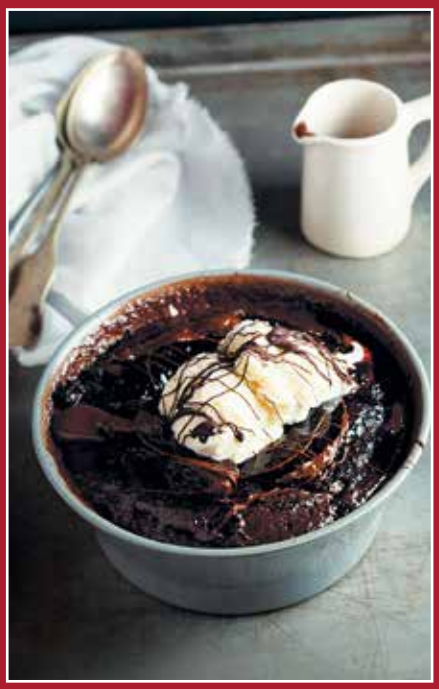
CHOCOLATE SYRUP
125ml water
100g sugar
30ml (2 tbsp) cocoa powder
good quality ice cream, to serve
dark chocolate, melted, to serve (optional)

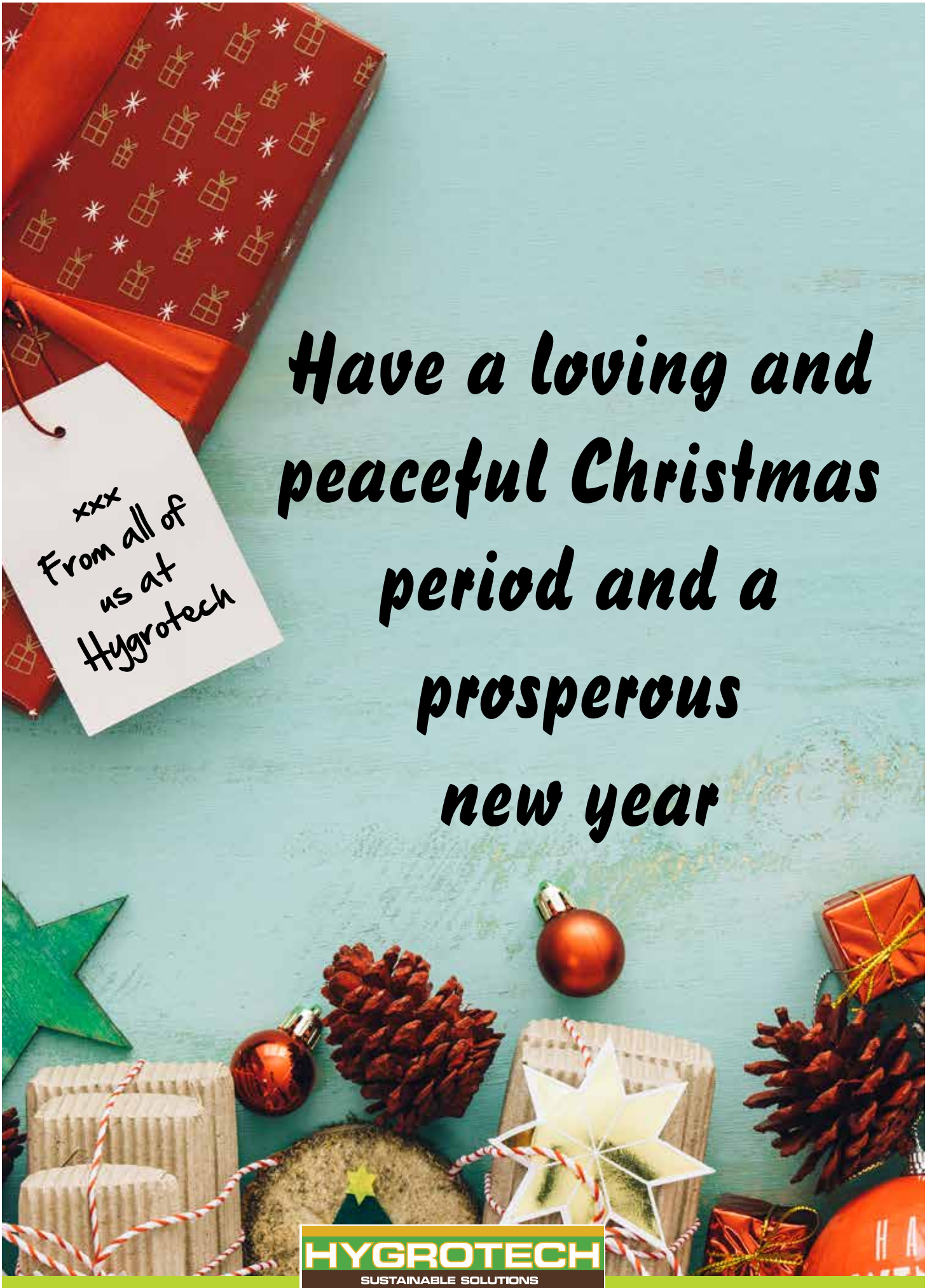
METHOD
1. Preheat the oven to 180 C and grease a medium ovenproof dish,
2. Sift together the flour, baking powder and cocoa powder, and set aside,
3. Melt the butter and chocolate over a double boiler until smooth,
4. Whisk together the sugar and eggs until light and creamy, Stir in the melted butter and chocolate and vanilla extract, Fold in the flour mixture followed by the milk and coffee,
5. Pour the batter into the prepared dish and place in the oven,
6. Bake until the pudding is cooked but still slightly gooey in the centre, 30 minutes,
7. For the syrup, heat all of the ingredients in a small saucepan and simmer until the sugar has dissolved and the syrup has reduced slightly, Pour over the pudding and allow to stand for 5 minutes,
8. Serve the pudding warm with ice cream and a drizzle of melted chocolate,

Baby Mielies with Smoked Butter, Chillies, Lemon and Garlic

Marinated Lamb Chops

Chocolate Brownie Pudding





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