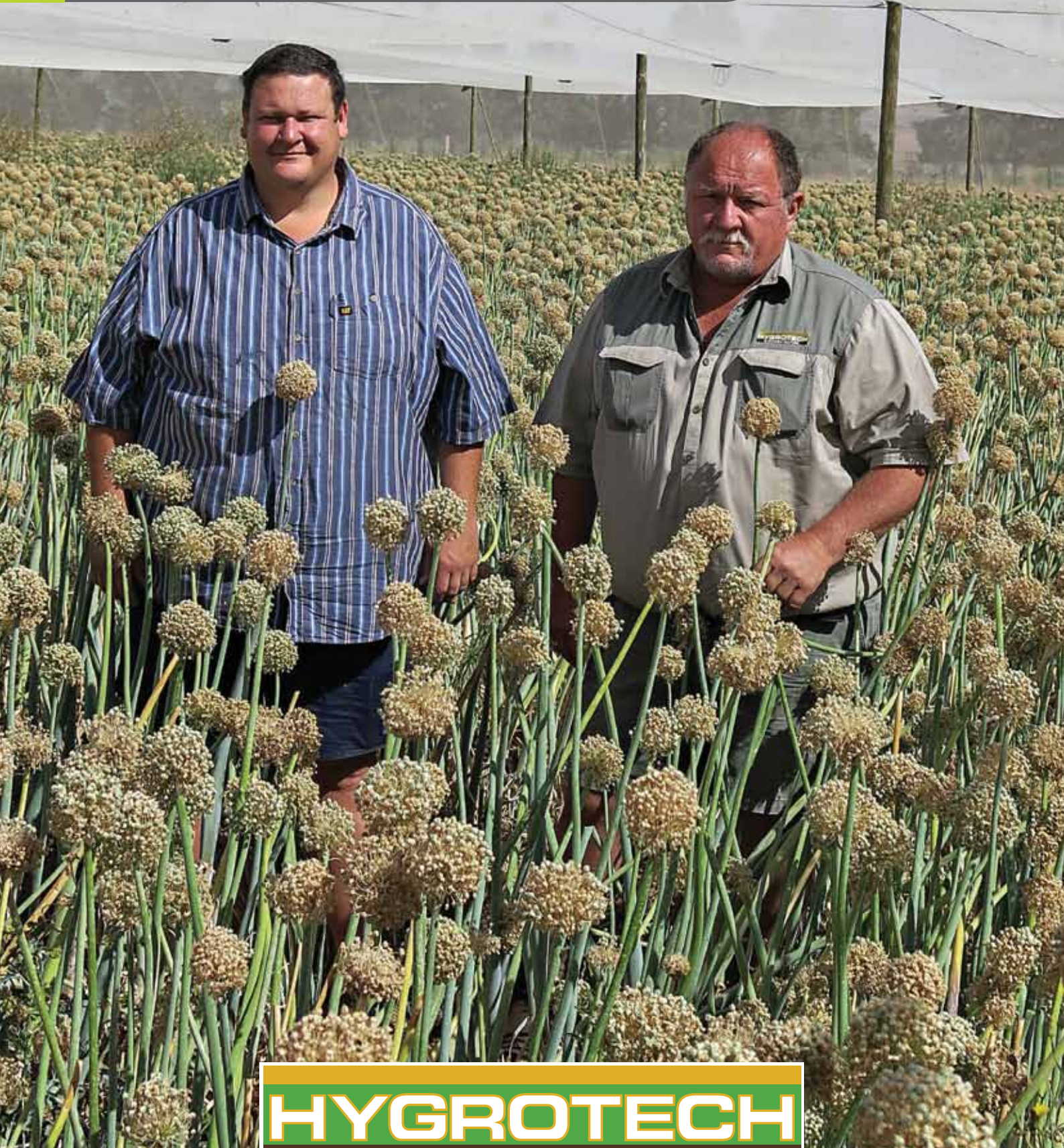


the FORUM



HYGROTECH

SUSTAINABLE SOLUTIONS

INSIDE: New baby marrows | Perlka in a nutshell | Seedcor carrots
Sweet pepper production | Tomato Qwanto | ZAR seed production | Tomato Batyla



how can we help you?

gain knowledge and grow.

AgriCommodities from FNB is an online market information system that collates information from a number of sources, allowing users to view daily information of the fresh produce, grain markets and weekly information for livestock and fibre. **It is the first service of its kind that enables you to create portfolio reports, which can be emailed to you on a daily basis.**

AgriCommodities is invaluable to a range of players in the agricultural sector. Farmers making use of the system have access to price and volume information to make informed business decisions. The system is also designed for use by fruit and vegetable vendors, processors, retailers, analysts and consultants.

Get information on all major markets, with payment options to suit you and the ability to generate reports in various formats.

Use FNB AgriCommodities to get the latest market prices.
Visit your nearest branch, email agric@fnbagricomms.co.za,
contact your Banker or visit www.fnbagricomms.co.za

First National Bank, a division of FirstRand Bank Limited. An authorised Financial Services and Credit Provider (NCRCP20).

FNB
First National Bank

AFRICA

SWAZILAND

Swaziland Agricultural Supplies
00268 2505 2708
Namboard 002682518604

ZIMBABWE

Pyramid (HO) 012 545 8000

ZAMBIA

Lusaka 00260 211 250454

MOZAMBIQUE

Pyramid (HO) 012 545 8000

KENYA

Nairobi 00254 020 2053916/7/8

BOTSWANA

Gaborone 00267 318 1346
Francistown 00267 241 3906

NAMIBIA

Windhoek 00264 61-253322 / 248493

SA

WEBSITE

www.hygrotech.co.za

BOSVELD

Potgietersrus 015 491 2651
Louis Trichardt 015 516 1504/5

LAEVELD

Tzaneen 015 307 2482
Nelspruit 013 753 3774

KZN

Pietermaritzburg 033 386 6009
Durban 031 465 4084
Pongola 034 413 1164

GAUTENG

Pyramid (HO) 012 545 8000

FREESTATE

Kroonstad 056 212 3232

NORTHERN CAPE

Kimberley 053 832 4332

SOUTHERN CAPE

East London 043 732 1147
Uitenhage 041 922 9466
George 044 870 7808

WESTERN CAPE

Stellenbosch 021 881 3830
Vredendal 027 213 5609
Ceres 023 316 209
Malmesbury 022 482 2570

CONTENTS

ON THE COVER: A beautiful field of onions, planted for seed production. See article on page 26.

New baby marrows	4
Open field peppers	5
Lawn info	6
Perlka in a nutshell	7
Seedcor carrots	8
Lucerne nutritional requirements	10
Butternut Geneva Maxi	12
Sweet corn info data bank	13
Tuta absoluta	14
Sweet pepper production	16
Tomato Qwanto	18
Seedcor cucumbers	19
Komatipoort winter field day	20
Tomato Settler	22
Entrée	24
Onion seed production	26
New lettuce	27
Miller sales meeting 2017	28
Nu-Film®	30
Rimember beans	34
New melons and watermelon	35
Tomato Batyla	36
ZAR seed production	38
Zambia report	39
Know our people	40



Editor

Theo Schoonraad

Tel: +27 12 545 8000 • Fax: +27 12 545 8088 • Cell: 083 273 2624 • tschoonraad@hygrotech.co.za

Graphic design and layout

Melani de Beer

Tel: +27 12 545 8000 • Fax: +27 12 545 8088 • melani.debeer@hygrotech.co.za

.....
This information is based on our observations and/or information from other sources. As crop performance depends on the interaction between the genetic potential of the seed and variety, its physiological characteristics, the environment including climate, disease pressure, water quality and quantity, management etc., we cannot give any warranty expressed or implied, for the accuracy, performance or applicability for the information, recommendations or products supplied, nor for the performance of crops or products relative to the information given, nor do we accept any liability for any loss, direct or consequential that may arise from whatsoever cause. * These cultivars are not on the official cultivar list, but applications have been, or will be submitted.

Coming Soon New Baby Marrows!

Changes within Hygrotech insured new cultivars and a baby-marrow trial in Komatipoort area has shown the way forward. Ten new cultivars have been planted, on a phase 2 trial basis, and very good material will be forthcoming in 2018.

We at Hygrotech are looking for products that will suit the South African market in all its diversity. The pre-pack markets, for instance, are looking for fruit between 12 – 14cm, with a diameter of 2, 5 – 3cm. This will insure a full punnet that will make the product attractive to the buyer. The box or bag market, prefer bigger fruit and normally the "over mature" fruits are sold in this format. The shape of the fruit could also be the reason for a cultivar to be classified under these two different groups.

The key in finding these types will differ from area and will include different shapes, sizes and colours according to the preferences of farmers and end-users.

Good news regarding the material available to us is that we will be able to source varieties from all over the globe in the coming year that could be used in all these mentioned categories.



The new ranges will offer the needed disease packages according to the area and market the grower requires. The main focus on the diseases will include ZYMV, WMV, CMV, PRSV & PM. Diversity in these disease resistance packages and other specifications, for example plant growth pattern, stem length and fruit setting, will determine the cultivar used in the different regions - with semi-spineless leaf stems the bonus on top.

We are looking forward to show case these new cultivars in 2018 and are confident that the new baby marrows from Hygrotech will perform to expectations, sooner than later !



Open field pepper cultivars

Numerous new options

With a cultivar like **Galba**, which has already been planted with great success because of its dark green fruit and thick walls and can weigh up to 250 g, the options and choices for new cultivars will be broadened. The new generation cultivars have better disease resistance and therefore maintain optimal productions.

Jawbone is a new addition to the pepper range with a disease package of TSWV, ToMV, PVY and Xcv 1-3. With this impressive resistance portfolio, this cultivar is suited to be cultivated in areas with high disease pressure. It delivers dark green fruit with mostly 4 lobes and medium thick walls which will later change its colour to red. The plants have the capacity to set new fruit continuously which will lengthen the harvest period and have a beneficial influence on the yield.

Radar has been trialed at different sites in our country over the last 2 years, with continuous good results. The cultivar has a disease package which includes the following : TSWV, TMV, Xcv 1-3, Mj. **Radar** produces uniform, blocky fruit with 4 lobes. The fruit are medium dark green which changes to red later. The plants have a high vigour which results in good leaf coverage against sun burn and damage.

Sidi is a cultivar which produces medium green fruit with medium thick walls. It has the following disease package : TSWV, TMV, Xcv 1-3, Mj. The fruit change to red after more or less 90 days. The fruit are big with medium thick walls. Fruit can weigh up to 220 g with good cultivation practices.

Lotto is a cultivar with a strong, open growth habit which produces medium green fruit of up to 200 g. Fruit change to red after 95 days. The fruit are blocky and uniform with medium thick walls. **Lotto** has the following complete disease package: TSWV, TMV, PVY, Xcv 1-3, Mj.

With cultivars like these, the production of peppers could only be flourishing and profitable !



WHY ARE LAWNS IMPORTANT ?

As a society we tend to take the benefits of grass for granted.

Aesthetically, lawns enhance the quality of life, contribute to social harmony and community pride, increase property values (by as much as 15 -20 % !) and compliment other landscape plants.

Turfgrasses have been utilized by humans to enhance their environment for more than 10 centuries. The complexity and comprehensiveness of these environmental benefits that improve our quality-of-life are just now being quantitatively documented through research.

Scientific evidence clearly shows that a healthy lawn is good for the environment. Because it's around us every day, people don't think about the fact that a healthy turf generates oxygen for improved air quality. Most homeowners don't realize noise and air pollution are reduced in most urban areas because the grass ecosystem serves as a natural filter for the environment.

Here are just a few of the many additional environmental benefits :

- Lawns provide excellent soil erosion control.
- Lawns improve recharge and quality protection of groundwater and provide flood control.
- Lawns enhance entrapment and biodegradation of synthetic organic compounds.
- Lawns absorb and sequester carbon dioxide gases.
- Lawns bring substantial urban heat dissipation which results in temperature moderation.
- Lawns contribute to home security as well, providing high visibility zones that deter potential intruders.
- Lawns are open green spaces that serve as a firebreak to reduce fire hazards.
- Lawns serve as a deterrent to rodents, snakes and other unwanted 'creepy crawlies' around the house.

Ref: The Lawn Institute / Dr. James B Beard – International Sports Turf Institute.



Kindly contact Theo Schoonraad (083 273 2624) for more information on the establishment and maintenance of a healthy lawn.



PERLKA IN A NUTSHELL

What is Perlka?

- **Perlka consists of**
 - ◇ 19.8% Nitrogen
 - ◇ 50% CaO(34 % Calcium)
 - ◇ 12 % Carbon
- **Perlka is a slow releasing Nitrogen source**
 - ◇ Perlka releases its full Nitrogen complement over a period of 70 days. Available Nitrogen is slowly released initially but increases over time as the plant's requirements increase.
- **Perlka is its own pH buffer**
 - ◇ Due to the high CaO content Perlka buffers its own acidifying of the soil. Thus Perlka will not acidify soils as with other Nitrogen sources.
- **Perlka is a Calcium source for the crop**
 - ◇ Two thirds of Perlka is in Calcium Nitrate form and is thus plant available, resulting in better yield and quality of the crop.
- **Perlka improves soil conditions**
 - ◇ The other third of the available Calcium in Perlka serves as soil conditioner similar to that of liming. This Calcium improves soil structure and improves soil pH over time.
- **Perlka is a Carbon source**
 - ◇ The Carbon in Perlka serves as food source for soil micro organisms.
- **Perlka suppresses soil borne pathogens**
 - ◇ As soon as Perlka comes into contact with moisture the Calcium Cyanamide converts to Hydrogen Cyanamide which is proven to suppress soil borne micro organisms.
- **Perlka suppresses weeds**
 - ◇ During the same phase Perlka can suppress most young and germinating weeds, if such weeds roots are within the treated soil profile.
- **Perlka stimulates beneficial soil micro organisms**
 - ◇ Perlka suppresses most soil microorganism populations. However, studies have shown that pathogenic organisms are more severely affected by Perlka. In turn, Perlka restores the population balance of all microorganisms in favour of beneficial populations.

Perlka suppresses Nematodes

- ◇ Various independent studies have shown that Perlka can suppress a variety of Nematodes after application.

Perlka suppresses snail and wireworm populations

- ◇ Perlka has shown to suppress snails in all phases and has similar effects on wireworms.

Functioning of Perlka

Dosage

- ◇ Perlka can be applied at 300-500 kg/ha pre-plant depending on disease pressure.

Application method

- ◇ Perlka can be broadcasted and then incorporated to the desired target depth. Perlka can also be band placed to reduce application rates.

Application depth

- ◇ Due to the slow leaching tempo of Perlka, the product should be applied to the same depth of the crops root zone. In cases where seed is directly sown, Perlka can be applied on top of the soil and washed in with irrigation.

Activation

- ◇ Perlka has to come into contact with moisture to start the activation process and convert to the active Hydrogen Cyanamide. Thus, fields have to be irrigated to field capacity and kept at this level for the duration of the withholding period for complete activation.

Withholding period

- ◇ 2-3 days per 100kg/ha is essential.

Subtraction of nutrients from the fertilizer programme

- ◇ All Nitrogen, Calcium Nitrate and Calcium must be subtracted from the current fertilizer programme to prevent over fertilization. Due to the slow Nitrogen leaching tempo of Perlka, an additional 10% can be subtracted in light soils and as much as 30% in heavy clay soils.

SEEDCOR **CARROTS** STILL TOPS !

After 7 years, the carrot range of Seedcor is still preferred by many producers in the Western Cape, Free State, Northwest and Kwazulu Natal.

With 4 commercial varieties and various other trial material, Seedcor can still compete with big suppliers when it comes to quality carrot seed with excellent vigour and germination. Seedcor offers a carrot range to plant throughout the year for various markets and needs.

The whole range of Seedcor is mature and ready for the market within 110 – 140 days, depending on season and area. The standing ability is also excellent and gives the producer enough time and space to shift harvest dates without sacrificing on yields.

Seed is available in any sizes from 1.4mm – 2.6mm and it's always strived for to satisfy the specific needs of producers.

The latest trial cultivar, BIANCHI, is performing very well against the current market leader. Technical information will be published in the next FORUM.



TECHNICAL INFORMATION

Carrots

Bentley F1



- Bentley has very good Alternaria tolerance.
- Good hardiness, well suited for conservation.
- Can be used for pre-pack and bunching.
- Slightly earlier maturity than Bengala.
- Strong leaf attachment with medium leaf size.
- Shape cylindrical to conical.
- Gives excellent length under difficult conditions.

Suitability	Pre-pack & Bunching Market
Type	Round - Fatima cross
Population/ha	1.5-2.2 million roots
Fruit Length	17 - 18 cm
Fruit Shape	Cylindrical to conical
Disease Resistance	Good Alternaria tolerance



Tel: +27 (0) 12 349 2816 / www.seedcor.co.za



All cultural and descriptive information is supplied in good faith, as a guide only. No liability will be accepted by Seedcor (Pty) Ltd or its representatives as to their performance based on this information. (This variety is not on the official variety list yet, but an application has been lodged)

TECHNICAL INFORMATION

Carrots

Bengala F1



- Bengala has round orange shoulders.
- Leaf attachment is strong.
- Very uniform.
- Bengala has medium disease tolerance.
- Is ideal for the pre-pack market.
- Leaf size is medium.

Suitability	Pre-pack Market
Type	Round
Population/ha	1.5-2.2 million roots
Fruit Length	16 - 18 cm
Fruit Shape	Cylindrical to conical
Disease Resistance	Good Alternaria tolerance



Tel: +27 (0) 12 349 2816 / www.seedcor.co.za



All cultural and descriptive information is supplied in good faith, as a guide only. No liability will be accepted by Seedcor (Pty) Ltd or its representatives as to their performance based on this information. (This variety is not on the official variety list yet, but an application has been lodged)

TECHNICAL INFORMATION

Carrots

Metro F1



- Late maturing Nantes type.
- Produces long cylindrical roots.
- Very healthy, tall tops.
- Roots are slightly longer than that of Bengala.
- Metro has good Alternaria dauci tolerance.
- Ideal for the pre-pack market.
- Very smooth.

Suitability	Pre-pack
Type	Nantes
Population/ha	1.5 - 2.2 million roots
Fruit Length	18 - 19 cm
Fruit Shape	Cylindrical to conical
Disease Resistance	Good Alternaria tolerance



Tel: +27 (0) 12 349 2816 / www.seedcor.co.za



All cultural and descriptive information is supplied in good faith, as a guide only. No liability will be accepted by Seedcor (Pty) Ltd or its representatives as to their performance based on this information. (This variety is not on the official variety list yet, but an application has been lodged)

TECHNICAL INFORMATION

Carrots

Bravo F1



- Bravo has round orange shoulders.
- Leaf attachment is strong.
- Very uniform.
- Bravo has medium disease tolerance.
- Ideal for the pre-pack market.
- Leaf size is medium.

Suitability	Pre-pack
Type	Nantes
Population/ha	1.5 - 2.2 million roots
Fruit Length	18 - 19 cm
Fruit Shape	Cylindrical to conical
Disease Resistance	Good Alternaria tolerance



Tel: +27 (0) 12 349 2816 / www.seedcor.co.za



All cultural and descriptive information is supplied in good faith, as a guide only. No liability will be accepted by Seedcor (Pty) Ltd or its representatives as to their performance based on this information. (This variety is not on the official variety list yet, but an application has been lodged)

	Feb	Mrt	Apr	Mei	Jun	Jul	Aug	Sep	Okt	Nov	Dec	Jan
Bentley												
Bengala												
Metro												
Bravo												

LUCERNE

Nutritional requirements for optimal results

Lucerne, also called Alfalfa (*Medicago sativa* L.) is known to be the oldest cultivated crop specifically grown for animal feed. Academic literature traces its origin back to Central Asia, but it is currently grown in most parts of the world in a wide variety of different climatic conditions to produce various forms of feed for a number of domesticated farm animal species. The very strong developed taproot system of lucerne plants provides access to water reserves deeper than 5 meters in some recorded cases, enabling it to survive long drought periods.

Management practices for lucerne production need to be in place before establishing the crop itself. This mainly entitles the (i) choice of a suitable land area, (ii) nutritional analyses of the soil and (iii) corrective measures in this regard, as well as (iv) seedbed preparation. The weed spectrum has to be addressed by either eradicating, or at least limiting the amount of viable seeds that might interfere with the growth and development of a newly planted lucerne crop. If applicable

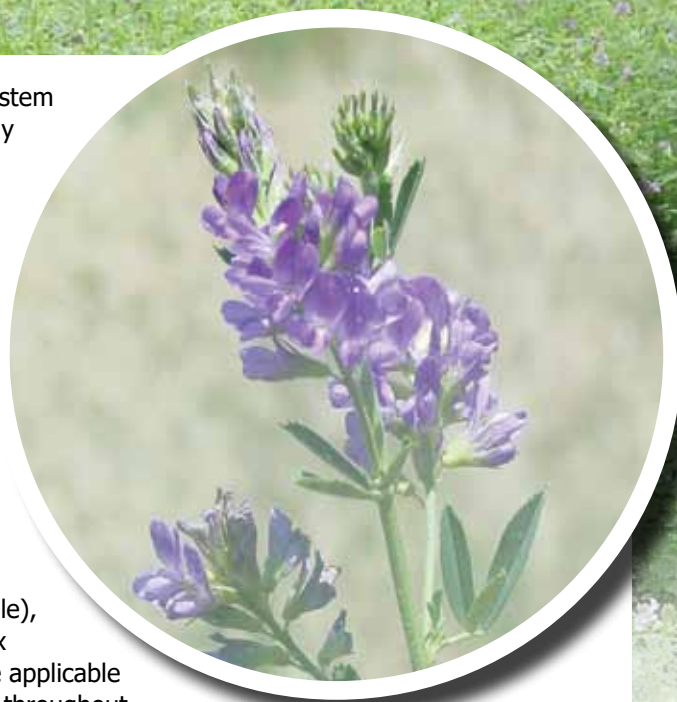
Table 1 - Amount of nutrient elements removed from the soil per ton dry material lucerne produced according to Undersander *et al* 1994:

Nutrient Elements	Removal per ton dry material (kg)
P	2.7 kg
K	21.0 kg
Ca	13.0 kg
Mg	2.7 kg
S	2.7 kg
Fe	150.0 g
Mn	50.0 g
B	40.0 g
Zn	20.0 g
Cu	5.0 g
Mo	0.09 g

the planned irrigation system also needs to be correctly laid out to ensure its efficacy.

Recent advances in chemical weed control also allows more frequent planting and establishment timeframes, instead of classical limited periods in early spring and late summer. Active ingredients of herbicides such as bromoxinil (nitrile), propaquizafop, imazamox (40SL), and paraquat are applicable at various growth stages throughout production. When considering the nutritional requirements of lucerne, various academic strategies have been trialed and tested in order to provide for optimal yields. Normally measured in tons per hectare (t/ha) but a lot of farmers and producers also refer to the amount of bales (either square or round) per square surface area. Average data collected under local conditions in South Africa under irrigated practice, states a possible 30-55 tons of wet mass per hectare per season, resulting in an estimated 15-25 tons/ha in eventual dry material. Figures for non-irrigated (dry land) production vary greatly depending on rainfall, and an average final dry weight is given as 4-8 t/ha per season. Bear in mind that maximum yield in the form of wet and/or dry mass of the eventual product(s), may not always result in maximal financial gain for the harvest at hand.

Because many nutrients which are removed come from the soil, it is normally not recommended that a fertilisation programme be worked out on the basis of nutrient removal values as indicated above. This should rather be done on the basis of soil analyses, as it provides the



most reliable method for preventing nutrient deficiencies.

Potential average yields of 15-25 tons per hectare (t/ha) of dry matter per season under irrigation are expected to vary between different production systems and climatic regions. It will also depend on the dormancy



Table 2 - Guidelines for applying phosphorus (P) and potassium (K) based on soil analyses, published by The National Lucerne Trust (NTL):

Soil-P content		Application for yield potential (dry material) t/ha				
		4	8	12	16	20
Bray 1 (mg/kg)		Phosphorus, P (Establishment and Maintenance) in kg/ha				
Clay content <15%	4	93	118	145	183	228
	8	73	98	125	163	208
	16	33	58	85	123	168
	24	10/0	18	45	83	128
	32	10/0	10/0	10/5	43	88
	40	10/0	10/0	10/0	10/3	48
Bray 1 (mg/kg)		Phosphorus, P (Establishment and Maintenance) in kg/ha				
Clay content >15%	4	121	153	189	237	296
	8	95	127	163	211	270
	16	43	75	111	159	218
	24	10/0	23	59	107	166
	32	10/0	10/0	10/7	55	114
	40	10/0	10/0	10/0	10/3	62

A minimum of 10 kg/ha is needed for high P soils. Rock phosphate is not recommended for lucerne, as the pH at which rock phosphate is effective is too low for lucerne production.

Soil-K content		Application for yield potential (dry material) t/ha				
		4	8	12	16	20
(mg/kg)		Potassium, K (Establishment) - kg/ha				
20		208	270	327	379	426
40		168	230	287	339	386
60		128	190	247	299	346
80		88	150	207	259	306
100		48	110	167	219	266
120		8	70	127	179	226
160		0	0	47	99	146
200		0	0	0	19	66

group of the specific variety or cultivar in question, and of course the nutritional status in the soil and how good (or bad) this is maintained.

Applications of foliar sprays in the form of specifically formulated products have shown to enhance the

overall performance in terms of yield and quality of lucerne fields.

Under optimal environmental conditions, a fair percentage of the active ingredients in these products will assist biological, physiological and biochemical processes in the plant.

Table 3 - Advised foliar spray application programme with water soluble fertilizers on lucerne:

3-4 Days after Cut	10-11 Days after Cut	17-18 Days after Cut
Hygrobuff 4 100ml/100L of H ₂ O	Hygrobuff 4 100ml/100L of H ₂ O	Hygrobuff 4 100ml/100L of H ₂ O
Fosfaspray 2.5kg/ha	Potaspray 2.5kg/ha	Calmabon Liquid 2.5L/ha
Sporekill® 100ml/100L of H ₂ O	Asco-Gro® 1.0L/ha	Asco-Gro® 1.0L/ha
Nu-Film P® 150ml/ha	Nu-Film P® 150ml/ha	Nu-Film P® 150ml/ha

From a plant nutritional point of view, the most important macro- and micro elements are supplied when using a weekly (or bi-weekly) spray programme.

Foliar application of phosphorous (P) and potassium (K) should be applied in the first 2 weeks after cutting. In addition, **SPOREKILL®** is added with the first foliar application to combat any possible secondary infections of disease that may occur after bruising the remaining new growth by cutting/harvesting practice.

FOSFASPRAY is a water soluble nutrient mixture with phosphate as the main component. There is 253g of P per kilogram of the formulated product. Phosphate plays an important role in photosynthesis and is an important structural component of plant cells. It further stimulates root development, and therefore water and nutrient uptake.

POTASPRAY contains 179g of potassium (K) per 1kg of the concentrated water soluble product. Potassium is well known for its primary role in the translocation of water and dissolved nutrients throughout the vascular system in all plants. When K supply is reduced, intracellular movement of nitrates, phosphates, calcium, magnesium, and amino acids is depressed.

HYGROBUFF 4 is added as a buffer-agent to optimize the pH of the spray mixture, and should always be done in the first instance, followed by the nutrient components and others in that order.

ASCO-GRO seaweed extract contains auxins and cytokines (plant growth hormones in amino acid form) that enhance growth and further provides relieve against plant stress conditions such as extreme temperature fluctuations and others.



It is generally accepted that the ratio between calcium (Ca) and magnesium (Mg) in the soil and plant should be a cation composition of 65 % to 25 % on a millequivalent % basis. **CALMABON LIQUID** is ideally suited to meet these requirements. An excess of calcium may result in a boron deficiency. The added boron in this formulation will assist in preventing this problem.

Nu-Film P sticker is added last to ensure maximal uptake of the applied components through the leaf cuticle, and also provides protection against wash-off by means of rain or irrigation water.

THE KEY STRENGTHS OF LUCERNE

- *Drought tolerant:* Lucerne has a deep rooting structure which allows it to access water and nutrients that have dropped out of the root zone of many other crops.
- *Soil builder:* As a legume, lucerne increases soil nitrogen (N) and organic matter enhancing soil structure and fertility.
- *Versatile:* Can be used for on-farm grazing and forage conservation or for producing silage or hay for sale.
- *Perennial crop:* Lucerne produces green-feed for much of the year. Productive stand life of 5-7 years.
- *Wide adaptability:* Lucerne grows well under a range of climatic and soil conditions.
- *High yielding:* Lucerne produces 12-20 tDM/ha/year.
- *Excellent feed quality:* Lucerne can be used to increase animal performance.
- *Strong global focus on lucerne breeding:* This means that new varieties with improved yield potential and greater disease resistance will be available into the future. ■

GENEVA MAXI

for the producer with purpose !

Every serious butternut grower has to adhere to specifications and specific market demands. Some markets want big butternuts which are utilized for processing, whilst other markets might want the smaller types eg. the supermarkets. The export market also seemed to prefer butternuts of between 0.8 – 1.8 kg the past two years.

GENEVA MAXI fits the bill because it could be planted for the export market as well as for the supermarkets with specifications of 0.8 – 1.8 kg fruit. The fruit is very uniform with a small seed cavity. Internally it has a deep orange colour and could easily be stored for 4 months. It has a semi-bush growth habit and very good field tolerance to powdery mildew. The fruit can be harvested within 85 days after planting.

GENEVA MAXI is more suitable for the main season plantings which extend from September through to December. If planted outside these time slots, fruit could be too small for specific markets. A stand of 14 000 plants per hectare is advisable to secure a good marketable crop.

If you therefore plant butternuts for a market with specific requirements, **GENEVA MAXI** would be your best option to consider.



SWEET CORN

information data bank

Over the past decade Hygrotech has published several sweet corn articles on new varietal developments in the sweet corn industry, as well as technical information articles stating specific newly found principles and guidelines. Hygrotech is closely working together with world renowned institutes and organizations who update us on new technical inputs and changes in the industry.

The frontrunners in the industry are Australian based suppliers and organizations who allow the industry to obtain updated information on Zea maize (sweet corn or maize) as crops.

Hereby are some of the articles and technical brochures that are available in the sweet corn information bank:

- Guideline for registered agrochemicals to control Fall armyworm in South Africa (Department of Agriculture, Forestry and Fisheries Directorate: Agricultural Inputs Control)
- Sweet Corn Pest and Disease Guide (© Horticulture Innovation Australia Limited, June 2015)
- Quality control of sweet corn seeds (LJ Swart, the Forum volume 1, 2017)
- New 2017 Varieties Hygrotech - Once upon a time there were 3 Musketeers and a 3006 caliber (LJ Swart, the Forum volume 1, 2016)
- No need to look anywhere else for sweet corn (LJ Swart, the Forum volume 2, 2016)
- The effects of storage conditions on seed shelf life (Pat Brownfield, Syngenta Seeds, Inc. Syngenta Seeds, Inc 2006)
- Sweet corn - practical growing guideline (LJ Swart, Langeberg Foods, 1994)



Hygrotech invites anyone interested in specialized technical information on sweet corn to contact Luhan Swart on 012-545 8000.

Tuta absoluta - Tomato Leafminer

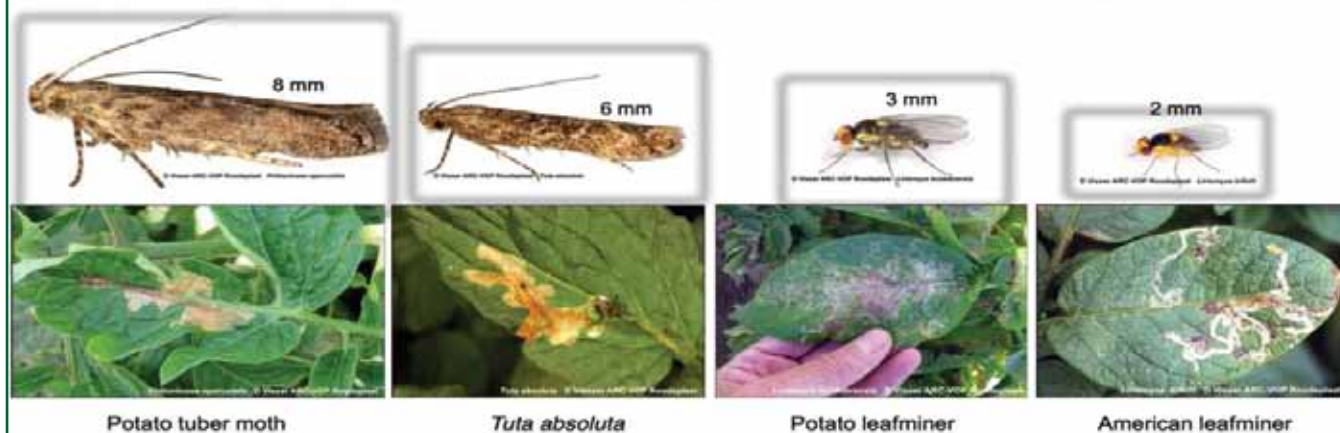
The danger to sustainable tomato production or not?

Origin: Tuta absoluta is one of the most destructive pests in tomatoes, it originated in South America and was first reported in Europe in 2006 and in South Africa in 2016.

Hosts: As indicated, the pest is mostly found on tomatoes, but other plants, within the same family Solanaceae, can also be hosts - such as potatoes, eggplants, tobacco and wild Cape gooseberry/ "gifappeltjies". Many weed species are also hosts of this pest and rare hosts include beans, cabbage marrows and others.



Leafminers that attack solanaceous crops (note: limitless variations of damage symptoms may be encountered)



Tuta absoluta Tomato leafminer

Phthorimaea operculella Potato tuber moth

Differences

Average size

The most prominent difference
Tuta 6 mm Tuber moth 8 mm

Antennae

More clearly banded in Tuta

Marks on wings

Black marks more pronounced and clear in tuber moth

Marks on thorax

Three stripes in tuber moth, none in Tuta

For final and conclusive identifications, analyses of the genital structures of the male moths are necessary.

Fully grown larvae



Tuta absoluta

Tomato leafminer

Length: 8 mm
Abdomen colour: greenish
Prothoracic shield: green with black line
Second thoracic segment: greenish



Phthorimaea operculella

Potato tuber moth

Length: 10 mm
Body colour: greenish brown to pinkish
Prothoracic shield: dark brown to black
Second thoracic segment: pinkish

Life cycle: Single eggs are laid on foliage or fruit, but could also appear in groups. It takes 4-5 days to hatch, larvae are light in colour when young becoming greenish later when they feed into the the leaves chlorofil stems and fruit. This takes approximately 8-14 days. There are 4 instar phases and the fourth one exits and pupates. Pupae are formed inside a strong silk cocoon constructed by the fourth instar at soil level, but also in leaf mines and folded foliage. Cocoons are mostly hidden or camouflaged by foliage and sand/dirt particles. Moths appear at 7-10 days and are very active at night because they are nocturnal insects. A moth can lay up to 260 eggs, most of it within a week. Complete life cycle is about 3-4 weeks, but in cooler times longer.

Control management

The use of an integrated pest management system is recommended which includes all the principles of basic pest control, but most important of all is to understand the life cycle of the insect *Tuta absoluta*. Farmers must know that the matured adult insect (moth) is active during early evenings and that spraying activity needs to be done during this time. The adult moths fly around and are actively laying eggs because they are day sensitive and are hiding during day time in the inner parts of the growing crop. Ensure also that proper adjuvants like Surebuff and NufilmP are used in combination with the registered chemicals which are alternated in a recommended spraying programme. Hygrotech is working nonstop to find so-called resistant tomato genetics and to incorporate it via natural breeding techniques into a dual purpose African tomato variety.



Damage to tomato plants

Tuta absoluta damages plants predominantly by feeding inside leaves (top left photo).

When population levels are high, leaf mines may merge, causing entire leaves and sometimes stems to die off. Most of the foliage may be destroyed in such cases, and large portions of plants may die off (left lower photo).

Larvae may move from one infested leaf to another, especially when leaves become chlorotic due to many larvae feeding together.

Young plantings may completely be destroyed while older plantings may suffer yield losses of 80 – 100%.

Damage to foliage is the primary cause of economic losses when larval numbers are high, but fruit may also be attacked (see next slide).

Tuta absoluta insecticides and pheromones

The following insecticides have emergency registrations in South Africa, December 2016 (Registrar of Act 36 of 1947)

Product name	Active ingredient	Crops	IRAC group
1. Coragen	Chlorantraniliprole	Tomatoes, potatoes, eggplant	28
2. Prevathon	Chlorantraniliprole	Tomatoes, potatoes	28
3. Belt	Flubendiamide	Tomatoes, potatoes, tobacco	28
4. Ampligo	Lambda-cyhalothrin & Chlorantraniliprole	Tomatoes, potatoes, eggplant, capsicums, tobacco	28 and 3
5. RB Hook Tuta	<i>T. absoluta</i> pheromone & Cypermethrin	on import permit	3
6. Tracer	Spinosad	Tomatoes, potatoes, cabbage, cucurbits, spinach, lettuce	5
7. Delegate	Spinetoram	Tomatoes, potatoes	5
8. Steward	Indoxacarb	Tomatoes, peppers, eggplant	22
9. Denim FR	Emamectin benzoate & Lufenuron	Tomatoes, eggplant, tobacco, capsicums	6 and 15
10. Delfin	<i>Bacillus thuringiensis</i>	Tomatoes, potatoes, eggplant, capsicums, tobacco	11
11. Eco BB	<i>Beauveria bassiana</i>	Tomatoes	unclassified
12. RB Spial Tuta	<i>T. absoluta</i> pheromone	Attractant; on import permit	na (no killing action)
13. RB Tuta Lure	<i>T. absoluta</i> pheromone	Attractant; on import permit	na (no killing action)

This presentation is an output of the *Tuta absoluta* Task Team of the South African Department of Agriculture, Forestry and Fisheries

Presentation produced by Diedrich Visser, ARC-Vegetable and Ornamental Plants, Roodeplaat

Additional inputs and checking by:

Jan Hendrik Venter, DAFF
Desiree van Heerden, IRAC & CropLife South Africa
Roedolf Nieuwenhuis, Crop Watch Africa

All photographs copyrighted as indicated on each photo.

Version of this presentation: v1.3
Date of this presentation: 11 December 2016
For any comments or further additions to the presentation: visser@arc.agric.za
For more information, and reports of new sightings: jan.hendrik.venter@daff.gov.za, Email: jan.hendrik.venter@daff.gov.za, Tel: no. 012 3196366



Open field sweet pepper production

new challenges addressed in farm trials.

Written by: Michael Luttig –
Area Marketing Manager: Nelspruit

During 2017 sweet pepper varieties from various Hygrotech suppliers were evaluated in the Komatipoort area at JF Steyn Boerdery in open field on-farm trials for the third consecutive year during winter production.

The requirements for open field sweet pepper varieties planted in the Komatipoort area have shifted in regards to yield, plant stamina, plant habit, planting slots, minimum disease package and fruit size. Our data and experience suggest that the days are numbered that one variety is suitable for all these requirements.

In recent years the start of the winter season was later or stayed away, resulting in an overlap with other production

areas with an oversupply of peppers at lower prices. Furthermore, due to high input costs, profit is only realized during the final production phase.

To maximize yield and profits, varieties were evaluated for the following criteria:

Planting slots: The standard variety in Komatipoort performs well in respect to fruit weight in the early planting slot, but was outcompeted by some of the Hygrotech varieties in the late planting slot. Therefore pepper producers should consider different varieties for different planting slots.

Fruit size and colour: Previously, Komatipoort farmers required large fruit mainly for the box pepper and hawkers markets, but in recent years smaller peppers of



Open field pepper trial at JF Steyn Boerdery, Komatipoort

below 200g for various super market packaging were also required. Fruit needs to be dark green and blocky with thick walls and four lobes that can travel well. Fruit must turn to an attractive red or yellow colour when reaching maturity.

Plant habit, plant stamina and yield: In order to farm peppers profitable, plants have to stay in production longer, with marketable fruit sizes at the end of the production cycle. The total yield of marketable peppers needs to be above average by preventing sunburn with a well-developed leaf canopy.

Disease package: In Komatipoort thrip numbers have exploded and with it, the risk of the thrip transmissible Tomato spotted wilt virus (TSWV). We therefore recommend that only varieties with TSWV resistance should be planted. Furthermore, the incidence of a new fruit symptom causing losses over the past two years that might be linked to a resistance breaking strain of TSWV on resistant pepper cultivars, was evaluated for in the trial.

Trial summary:

A total of 46 pepper varieties were planted 23 May 2017, of which 8 commercial varieties and 30 new varieties were evaluated and compared to 4 standard varieties. Varieties that comply with the criteria set out for the trial were:

In the box market peppers, green/red varieties **Rubistar**, **Galba** and **Nero** outperformed the standard in the late planting slot in respect of fruit size, whilst **Sidi** and **Lotto** were similar to the standard.



12PE9204 is a blocky dark green open field pepper with thick walls that turns yellow with an excellent shelf life.



Pepper 15PE9236 is a medium pepper suitable for robot packs



Pepper Rubistar is a large pepper for the box market

Jawbone and **Radar** gave medium size dark green/red fruit of high quality, ideal for robot packs.

Of the new varieties, 3 varieties performed as excellent dark green/red peppers for the box market as well as for robot packs.

Two new yellow varieties, as well as **Acanary**, stood out against the yellow standard pepper in the open field trial and can be used in the medium pepper market as well as box market. The new varieties will be evaluated in all the different pepper production areas.

We would like to thank Jakkals Steyn and sons, owner of JF Steyn Boerdery, permitting Hygrotech to do this valuable on site trials.

Qwanto - hawker or saladette?



Disease package: V,F,N,P,TYLC,BW

It has taken the African hawker market 8 years since 2008 to find a suitable replacement for the hawker tomato HTX14.

Qwanto was first trialed and evaluated in 2006 when it was planted in a processing tomato trial and showed exceptional yields and disease tolerance. This all happened during an extreme summer growing season with high incidence of diseases such as early and late blight, plus bacterial speck. Qwanto stood out from the rest of the varieties due to exceptional visibly better leave conditions and it was immediately accepted by Hygrotech as an alternative in the market.

We did not visualize then that Qwanto will become a role player in the hawker market in future due to its widely adaptable growing habits - from the sub tropics to the tropical areas of South Africa and due to its exceptional high yields and very firm EFS fruits. Qwanto is grown successfully all over different SADC countries such as Mozambique, Zambia, South Africa and is also been introduced in many other African countries, especially in areas where bacterial wilt has been a major problem during rainy seasons causing leave diseases. It's been reported from Mozambique that Qwanto yielded more than 120 ton/ha on a planned fertilizer and input programme of 80 tons per hectare. In South Africa it's been a successful variety and can be transported more than a 1000km in harvesting crates from northern regions in Limpopo down to Durban. In 2017 trials in Komatipoort it showed exceptional fruit quality, almost that of a saladette, and some farmers are utilizing the better shape of Qwanto compared to HTX14, as a suitable replacement in the saladette market.

A practical growing guide on Qwanto:	
Input	Recommendation
Plants per hectare	25000
Spacing	1.8 meter rows double row 3 plants per 60mm dripper
Fertilizer level	200 N kg/ha 100 P kg/ha 300 K kg/ha
Fruit weight	100-120gram
Planting slot	12 months per year frost free areas
Fruit use	Hawker / Saladette



SEEDCOR

CUCUMBERS

enter the market

Two new cucumber cultivars have been launched and will enter the market after both displayed potential during trials. Both cultivars have excellent disease packages which will make it even more attractive to producers.

DERAILER, with fruit lengths of between 30 cm to 40 cm, is the cultivar that could be planted during spring and summer. The fruit is very uniform with well rounded shoulders and slightly ribbed. The plant has an open growth habit and is very vigorous. It consists of the following disease package : CYSDV, CVYV, CMV, PM, Scab.

FIZIK is the autumn and winter cultivar with fruit ranging from 32 cm to 36 cm, with well rounded shoulders.

The fruit is slightly ribbed with a glossy appearance. It has a medium open growth habit and is very vigorous. The cultivar has good resistance against Powdery Mildew which could be a problem during winter months.

To assist DERAILER and FIZIK, the plants could be grafted on ISABELLA to secure a better plant and yield. During an extensive semi-commercial trial, it was seen that all cultivars grafted on ISABELLA, produced 1 fruit per plant more. Producers who have problems with Fusarium and Nematodes, should consider ISABELLA as this cultivar has good resistance against these two problems.

With summer in our midst, it will provide producers the opportunity now to plant DERAILER against other commercial cultivars. Both DERAILER and FIZIK originate from the same breeding programme and are therefore safe options to try.

The end result will not disappoint you !



Komatipoort Winter Field Day

14 September 2017

Hygrotech hosted their annual winter field day at the farm of JF Steyn Boerdery in the Strydomsblok, Komatipoort. This year was the third consecutive year that the field day was held at JF Steyn Boerdery.

During this field day, Hygrotech focused on the following species: sweet pepper, hot pepper, squash, eggplant, beans, all types of tomatoes and sweet corn.

A total of 205 varieties were tested, mostly commercial varieties, but also semi-commercial varieties. In all instances Hygrotech incorporated the market standards in the trial for comparison purposes. The day was enjoyed by over 175 farmers from and across our borders.

Hygrotech would like to thank Mr Jakkals Steyn and his two sons, Francois and Ruan, for the excellent preparations of the trial fields. Hygrotech would also like to thank the Area Marketing Manager of the Nelspruit Region, Michael Luttig, for all his hard work and contributions as well as the frequent visits by Christo Le Grange, Hygrotech National Product Development Manager, in preparation for this day. Once again, it was a great success!



Luhan Swart from Hygrotech head office, Product Specialist on sweet corn, beans and tomatoes, giving an information session on the varieties.



Habe Roode - Chairperson of the Hygrotech Group and Product Manager on tomatoes, having a conversation with Gustav van Veyeren, about the excellent new tomato varieties.

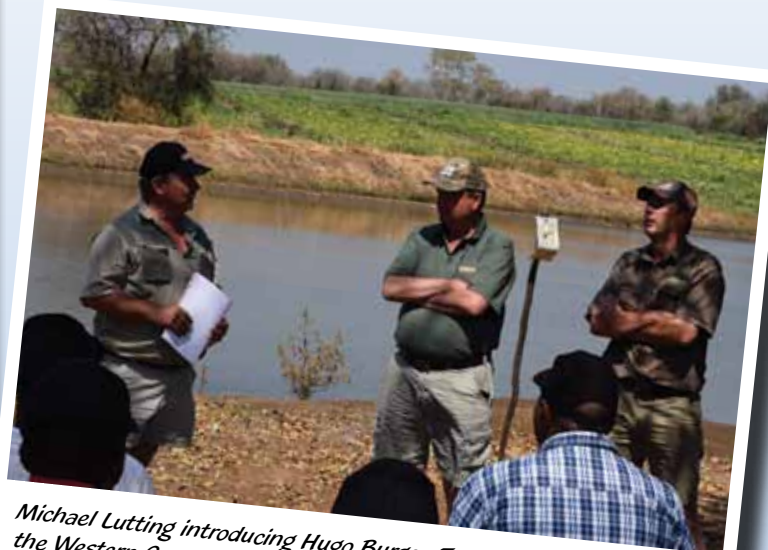


Rajen Rajcoomher from Hygrotech with two of his KZN clients

Trial fields in the Strydomsblok, Komatipoort.



Christo Le Grange, National Product Development Manager, sharing information on our newest varieties.



Michael Lutting introducing Hugo Burger, Technical Manager of the Western Cape, with Christo Le Grange standing on the right.



Rajen Rajcoomher from Hygrotech KZN Branch evaluating the Hot Pepper varieties.



Habe Roode giving an informative session on saladette tomatoes.



Michael Luttig together with Ruan van Dyk, tomato farmer from White River



Michael Luttig welcoming all the farmers that attended the information day.



Michael Luttig thanking Mr Francois Steyn together with his farm management and labourers for the excellent preparation of the trial fields.

SETTLER

The Fast and Furious

Settler tomato is one of the varieties of Hygrotech that still remains reliable and has an excellent yield potential. It has a compact plant with a concentrated fruit set. Settler is a determinate fresh market round tomato that bears firm fruit with a deep red colour and a small blossom end. Settler delivers an average fruit size between 130 -160g in only 75 - 80 days and with a very good shelf life. Settler tomato can produce up to 120 tons per hectare of tomatoes if all growing conditions are favourable.

Settler tomato has a great disease package which gives resistance or tolerance against the following: **Verticillium, Fusarium Race 2, Tomato Mosaic Virus, Nematodes and Tomato Spotted Wilt.**



Settler tomatoes in production.



Farmers with Settler tomato success.



Settler tomatoes in net structures.



With all this said, Settler tomato has an economical advantage in that it's not too expensive and you can save on input cost. Settler doesn't need long poles for trellising and it can be harvested from the 11th week through to the 17th week. This means less time in the field and you therefore save on fertilizer, spraying, watering and less labourers for picking because its sets in a shorter time.

**Settler tomato has a different fertilizer requirement than most other tomatoes.
Good results were obtained with the following fertilizer programme:**

Nitrogen - 160 kg N/ha (Apply 10% pre-plant and 40% in an ammonium form and 50% in the Nitrate form before flowering.)

Phosphate - 90 kg P/ha (Apply 80 % as pre-plant depending on soil analysis and the rest at fruit set in the form of MAP.)

Potassium - 260 kg K/ha (Apply 30 % as pre-plant and the rest from week 3 after transplant to the end, depending on soil analysis)

Calciumnitrate - 300 kg/ha (Apply from week 2 after transplant to end, depending on soil analysis)

Magnesium nitrate - 150 kg/ha (Apply from week 2-6 after transplant, depending on soil analysis)

Sulphate – Tomatoes have a great requirement for sulphate and it can be applied in the form of Ammonium sulphate, Magnesium sulphate, and Potassium sulphate.

Micro Nutrients – The whole range is available - scrutinize the soil analysis and get recommendations from a qualified expert.

**For any recommendation or more information, contact your Hygrotech field representative.
The success of Settler tomato production depends on good soil analysis, good management and favourable climatic conditions.**

Settler tomato plants in production.



ENTRÉE

MULTI FACET ADJUVANT



by Johann van der Vyver, Director: Miller Chemical SA (Pty) Ltd

Entrée is a non-ionic activator enhancer adjuvant from Miller Chemical & Fertilizer, LLC and is registered in South Africa (Reg. No. L8055 according to Act 36 of 1947) to increase the efficacy of post-emergence herbicides. In addition, Entrée is also recommended to be used with the insecticides Coragen® or Prevathon® (200 g/L chlorantraniliprole) - both products from DU PONT® - on the individual registered product labels.

FORMULATION



Schematic illustration of the components and unique nature of the Entrée formulation.

PRACTICAL REASONS FOR USING ENTRÉE

Below are multi-facet advantages (as well as some illustrations) for using Entrée:

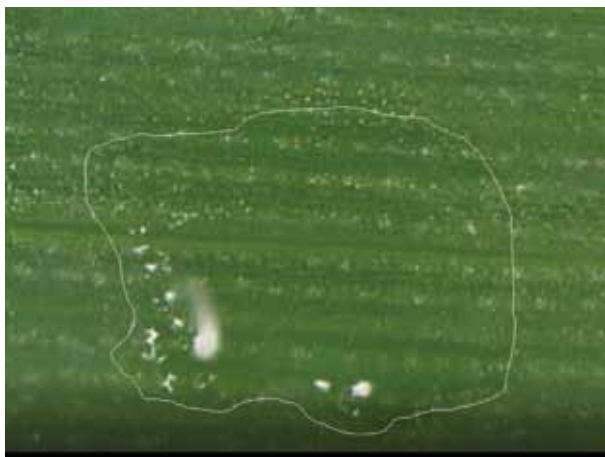
- Reduces crystallization of agrichemicals on plant surface to facilitate absorption into the plant.
- Prolongs agrichemical absorption by plant.
- Designed to improve oil soluble pesticides.
- Designed to improve water-soluble pesticides as well.
- Designed for tank mixes containing both oil soluble and water-soluble pesticides.
- Translocates oil soluble and water-soluble pesticides through oil and water-soluble areas of leaf respectively.

} VERY IMPORTANT

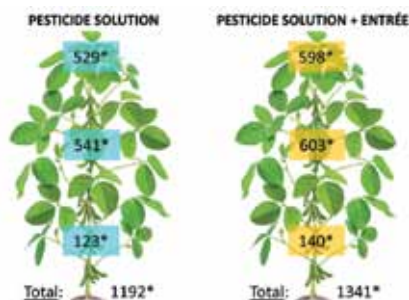
- Enhances deposition.
- Enhances coverage on plant surfaces (grass and broad leaf types).
- Increases pesticide retention.
- Not affected by water pH.
- Does not dry rapidly under high climatic temperatures.
- Not hard on crops under stress.

Examples of oil and water-soluble herbicide active ingredients

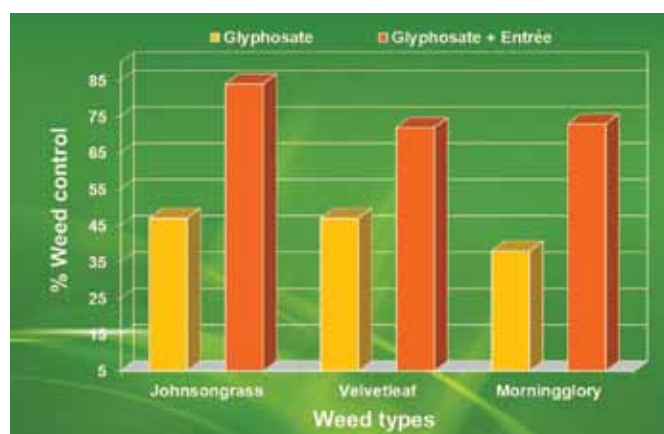
OIL SOLUBLE	WATER SOLUBLE
atrazine	glyphosate
fluazifop-p-butyl	paraquat
carfentrazone-ethyl	nicosulfuron
tralkoxydim	bentazon (sodium salt)
oxyfluorfen	rimsulfuron



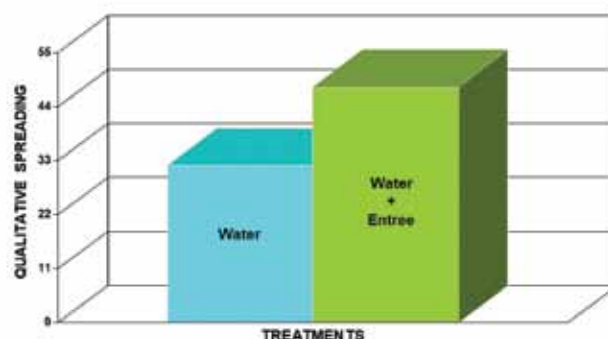
Video screencap of water droplet (bottom) and water droplet with Entrée (top) after being applied onto surface of annual grass. Note the amount of spreading of water droplet containing Entrée.



Visual illustration summarizing the ability of Entrée to increase spray deposition onto soy bean plants (*expressed as μg dye per gram fresh weight leaves at top, middle and bottom). Application conducted at 80% canopy closure). Study conducted by agroTECHNOLOGY RESEARCH.



Graphic summary of trial results demonstrating the ability of Entrée to enhance the efficacy of glyphosate herbicide on various weeds with different plant surfaces (grass and broad leaf types). Study conducted by Agrobiology Research.



Graphic summary illustrating the ability of Entrée in water to improve the qualitative spreading (measured as variation in pigment distribution per leaf) of a spray application on navel trees by means of the addition of a fluorescent pigment to spray-tank water. Study conducted by Citrus Research International.

INTERNATIONAL RECOGNITION

Entrée is marketed internationally as Exit®, the original USA name. Exit® is certified in the USA according to the CPDA (Council of Producers & Distributors of Agrotechnology) Adjuvant Certification Program (<http://cpda.com/adjuvant-certification-program/>). Adjuvants are not required in the USA to be registered by the U.S. Environmental Protection Agency (EPA). The State of California does however require adjuvants to be registered. Exit® is registered (Exit® California Reg. No.: 90930-50014) as such in California. **Official independent sales figures from the State of California for 2015 and 2016 indicate Exit® to be the adjuvant used the most on acreage on a variety of 168 crops. These were (converted to hectares) 382 200 ha in 2015 and 364 217 ha in 2016.**

Should you wish to attain more information regarding the exciting qualities of Entrée, please contact your nearest Hygrotech branch or johannvdv@millerchemical.com

INTENSIVE ONION SEED PRODUCTION AT HYGROTECH'S RESEARCH FARM AT DEWAGENSDRIFT

A year or so ago the Hygrotech management decided to enclose a 2 ha piece of land with hail netting to protect high value breeding trials and basic seed increases of their IP material from the fairly usual summer hail storms in the Gauteng area.

Being very involved in a diversified onion breeding programme in both F1 hybrids and unique, selected Open Pollinated material, it was prudent to do a one hectare commercial seed increase of a new variety RODEO, a late short day, firm, brown skinned onion with wide adaptability for commercial sales in 2018.

With intense bulb selection and a lot of TLC (Tender Love and Care), Luhan and Hennie managed to create a production platform for a very high yielding seed crop of RODEO.

WELL DONE GUYS !



Close-up of the exceptional seed set in controlled and optimal conditions under one hectare of hail netting.



Hennie Pienaar, Trial Farm Manager and Luhan Swart, Technical Manager waist high in the RODEO seed crop.

Exquisite new lettuce material on the horizon

Written by Dr. Martin Maboko - Hygrotech H/O



Cos lettuce (Romaine)



Crisphead lettuce with compact head and short internal stem



Crisphead lettuce of good quality parameters such as compact head and short internal stem growth.

Lettuce (*Lactuca sativa* L.) is a cool season crop requiring growth temperatures ranging from 7 to 24 °C, with an average of 18 °C and it can tolerate winter cold and light frosts. Lettuce cultivars that are not adapted to high temperature can result in the development of physiological disorders such as tip-burn, rib discoloration, loose heads of inferior quality, internal stem growth, bolting (develop seeds stalk). However, the difference in tolerance to cold and heat differs among the cultivars.

Crisphead lettuce, also known as 'Iceberg' lettuce, is still dominating in the South African fresh market produce. The name 'Iceberg' lettuce came about in the USA, due to the fact that lettuce was often transported over long distance in trucks filled with large amounts of ice to preserve it or slow down its wilting and decay, thus allowing the product to arrive at the market while still fresh.

Hygrotech is currently researching, trialing and evaluating new exquisite and unique cos and crisphead lettuce varieties in Gauteng, KwaZulu-Natal and Western Cape provinces. Preliminary results have shown great potential of new varieties to outperform and compete with other varieties of lettuce in the market. Crisphead varieties with good quality characteristics such as short internal stem height, compact head, taste, field uniformity, tip-burn resistance, good leaf coverage with additional disease packages have been identified.

Lettuce growers, look out for these new, exciting crisphead and cos cultivars to be released, semi-commercially and commercially, in early 2018.

2017 International Miller Chemical & Fertilizer, LLC Sales Meeting

(by Johann van der Vyver, Director: Miller Chemical SA (Pty) Ltd)



Ever since I joined Miller Chemical in February 2017, I have been looking forward to the annual International Miller Sales Meeting. An opportunity for Miller colleagues around the world to meet, discuss strategies, equip and provide feedback of successful projects. Looking back at my first meeting, I realise the privilege to attend this meeting.

DATE, VENUE AND ATTENDEES

The meeting was from Sunday evening, 22 October 2017 until noon on Friday, 27 October 2017. Like previous years the venue was at the Sheraton Hotel in Towson, Baltimore North, Maryland, USA. A high-quality venue, catering especially for these types of events. Attendees included Miller Head Office and sales personnel representing 49 of the 50 USA states and 51 countries worldwide. The total years of experience within the agriculture sector of all the attendees together were an astonishing 1166 years! Experience that reassured me as Miller newcomer and that should also go a long way in reassuring our global clients that deal with Miller products on a daily basis. 2017 was also the 80th Anniversary of Miller Chemical!



Outside of Sheraton Hotel in Baltimore where meeting was held.

PROGRAMME

The first two days the USA and International personnel were divided into two smaller groups. For the international group (where I was involved) the intend was to familiarize us with the successes, new opportunities, but also challenges of each region. Similarities were especially focused upon. I was intrigued with new product (products not yet developed in SA) opportunities as presented by my colleagues. Presentations from personnel within the European Union (EU), or from countries that export to the EU were especially relevant from a South African perspective. Challenges with regards to agricultural product registrations or changing in registration requirements for each of the various regions were discussed in detail. It was comforting to witness the knowledge, advice, experience and data magnitude among the group. This encouraged me for our own challenges.



1116 years of total experience among Miller personnel that attended the Sales Meeting

On day three the entire group received hands-on sales training presented by Paul Cherry and Patrick Connor from Performance Based Results LLC who have good experience within the agricultural business centre. For many it was new ideas and for other a valuable reminder and reiterating of well-known concepts. The focus was to truly listen and understand the needs of our clients and to combine that with adequate product and industry knowledge. Practical role-play and scenario setting assisted in driving the message home.

Days 4 and 5 presentations were presented by various Miller personnel and guest speakers. These were in relation to successes from Miller product applications, as well as other relevant subjects. Relevant to South Africa were:

- "Miller products raise the bar in high tunnel production" by Sam Evans (Miller USA).
- "Greenstim (Grotonic in SA) on squash" by Walt Morgan (Miller USA).
- "Miller products not only for improving quality and yield, but mitigating climate stress on table grapes" by Maria Karamagiolo (Miller Greece).
- "Exit® (Entrée in SA) adjuvant development in Turkey" by Atilla Akin (Miller Turkey).
- "Exit®/ Dormex work on grapes" by Guido Artavia (Miller Peru).
- "Evaluation of adjuvants on efficacy of biologicals" by Augustin Oviedo (Miller Mexico)"
- In relation to Miller success in South Africa, I was requested to present the following topics:
- "Sustain® trials on wheat in South Africa".
- "Advancing Mist Control® in South Africa via demonstrations and US support".

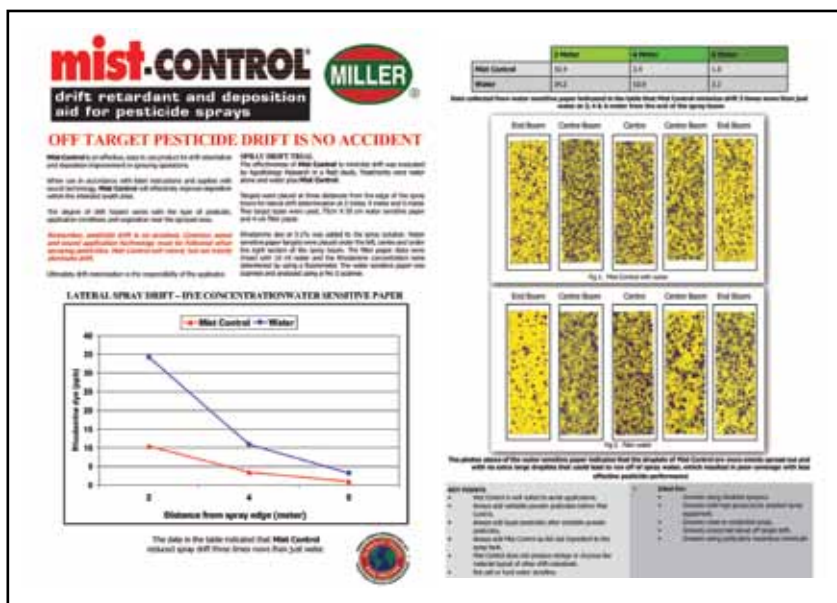
Among the guest speakers was Dr. Patrick McMullan an independent adjuvant, agrochemical and crop enhancement consultant, as well as the owner of Ramulus LLC. Some Hygrotech Forum readers might remember Mist Control® trial data of Dr. McMullan that was published last year. The topics and content of both Dr McMullan's presentations were really intriguing. Especially coming from an independent speaker. These were:

- "Adjuvant review: Uniqueness of Miller adjuvants".
- "Hybrid HSMOC 3rd study". Hybrid is a newly developed Miller adjuvant.

Over the next few months to a year, many of the information received will be shared with Miller clients in SA. New product opportunities will also be investigated.



Geographic summary of current Miller global distribution.



Article in Hygrotech Forum (2016:1) by Johann Korkie with regards to independent study with Mist Control® by Dr. McMullan



From left to right: Johann van der Vyver, Dr. Patrick McMullan, (owner of Ramulus LLC) and Mike Fiery (Miller Chemical and Fertilization Vice-President: Marketing and Product Development) at the Miller sales meeting.

Should you wish to receive detail on any of the presentations listed earlier, please contact johannvdv@millerchemical.com or your nearest Hygrotech branch.

IMPROVE THE COVERAGE OF AGRICULTURAL SPRAYS ON PLANT SURFACE WITH

Nu-Film®



(By Johann van der Vyver, Director: Miller Chemical SA (Pty) Ltd)

This is the second of a 3-part series that focus on the major objectives for using Nu-Film® within foliar spray applications.

- In the previous part Nu-Film®'s "Increased deposition (retention) of agricultural chemical sprays onto the plant surface at the time of application – QUANTATIVE BENEFIT" was discussed.
- In this part Nu-Film®'s improved coverage (in addition to increased deposition) of agricultural spray droplets on the plant surface at the time of application – QUALITATIVE BENEFIT – will be discussed.
 - ◇ BOTH THESE BENEFITS ARE GROUPED AS NU-FILM®'s **IMMEDIATE BENEFIT**
 - ◇ In the 3rd part Nu-Film®'s ability to prolong the presence of agricultural chemicals on the plant surface – **TIME BENEFIT** – will be discussed. The effect of all 3 benefits, to improve pesticide efficacy, will also be illustrated.

In the discussion to follow, "Nu-Film®", will imply a general characteristic of both Nu-Film® P and Nu-Film® 17. "Nu-Film® P or Nu-Film® 17" will however be referred to where a specific study was conducted with either of the two products.

SPRAY DEPOSITION

The Weed Management Handbook mentions that spray deposition is characterized by two measurements:

- **Retention** – the amount of liquid (containing agricultural chemical) retained on the plant, and
- **Coverage** – the percentage of the plant surface covered by the deposit.

As a simple rule of thumb, retention is generally more important for translocated pesticides, where the amount of active ingredient on the plant is important for efficacy. Coverage is more important for contact pesticides, where proper/ uniform surface coverage of the plant is important for efficacy. Coverage can be described by the following equation:

$$\text{Coverage} = \text{retention} \times \text{liquid spreading on surface} \times F$$

(F is a factor to allow for droplets and spreading overlapping on the surface)

Although liquid spreading is among other a function of coverage, too much liquid spreading or droplet spreading on the plant surface can have a negative effect. Sufficient ("proper") spreading – uniform, not too much (avoiding

run-off from plant surface), but also not too little (to acquire as much possible coverage of plant surface) – is very important. The contribution of sophisticated application methods (equipment, nozzles, spray pressure, application volume etc) to achieve sufficient spreading on plant surfaces cannot be over emphasised. In addition, adjuvants are often used to fine tune the final desired spray deposition result. Here Nu-Film® has a critical role to play. Its retention abilities have been discussed in part 1. In this part, its ability to allow for sufficient droplet spreading will be discussed.



Photo 1: Video screencap of water droplet (bottom) and water droplet with Nu-Film® (top) after application onto maize surface. Note the amount of spreading of water droplet containing Nu-Film®. Conducted by USDA. (Video available upon request)

DROPLET SPREADING

Spreading – up to a certain extend - of spray droplets by Nu-Film® after application onto plant surfaces has been illustrated many times and is well documented. Spreading of a droplet with Nu-Film® applied to maize leaf compared to a water droplet only are illustrated by two simple video-clips from the United States Department of Agriculture (USDA). In photo 1 screenshots of both videos indicate the difference.

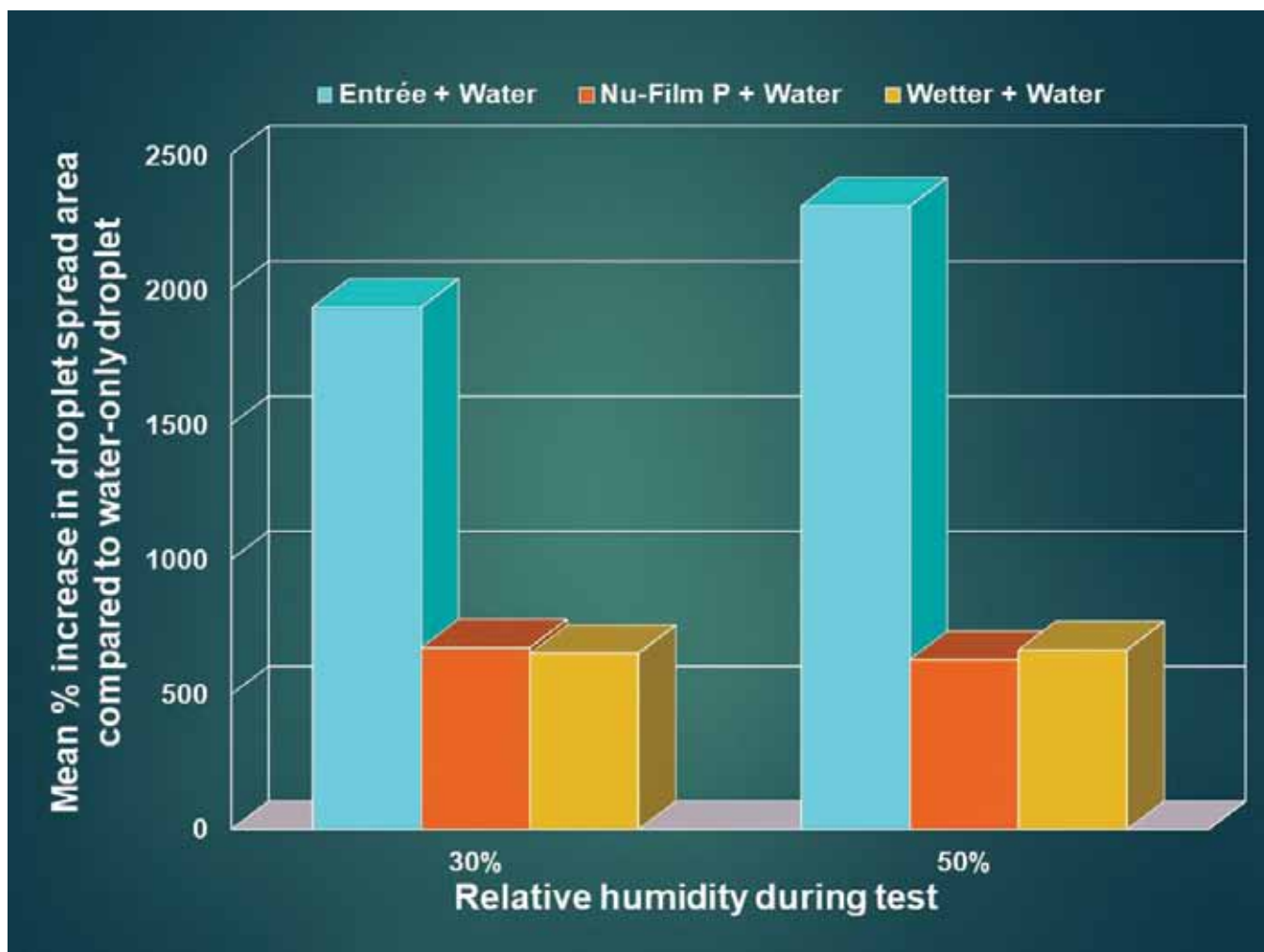


Figure 1: Graphic summary of mean percentage increase in spreading of various 400 µm adjuvant amended water droplets on maize leaf surface compared to water-only droplets. Ambient temperature during study: 32° C. Relative humidity 30% and 50%. Study conducted by Dr. Heping Zhu (USDA).

The USDA study also quantified the water droplet spreading by Nu-Film® on a maize plant surface in comparison to a water droplet only and water droplets containing other adjuvants (see Figure 1). Nu-Film® increased droplet spreading more than 5-fold. Of significance is that Nu-Film® (with adhesion qualities as well) increased spreading as good as a commercial wetting product (without adhesion qualities). The study also confirmed the superior spreading ability of Entrée in addition to its many other qualities (refer to page 24)

DEPOSITION AND SPREADING

The ability of Nu-Film® P to improve deposit AND spreading of spray droplets of a fungicide spray mix on grape leaves were brilliantly illustrated in a study by the University of Stellenbosch in South Africa (see Figure 2). A fluorescent pigment product was used to illustrate quantitative deposition (percentage fluorescent pigment coverage - %FPC) and qualitative deposition/ spreading (pixel distance between pigment particles) of various spray mixtures. The improved deposit and spreading by Nu-Film® P was also better than that of a commercial wetting product.

Several field studies on various crop types using related UV sensitive dye resulted in similar results. Looking at these photos, a picture really speaks a thousand words!

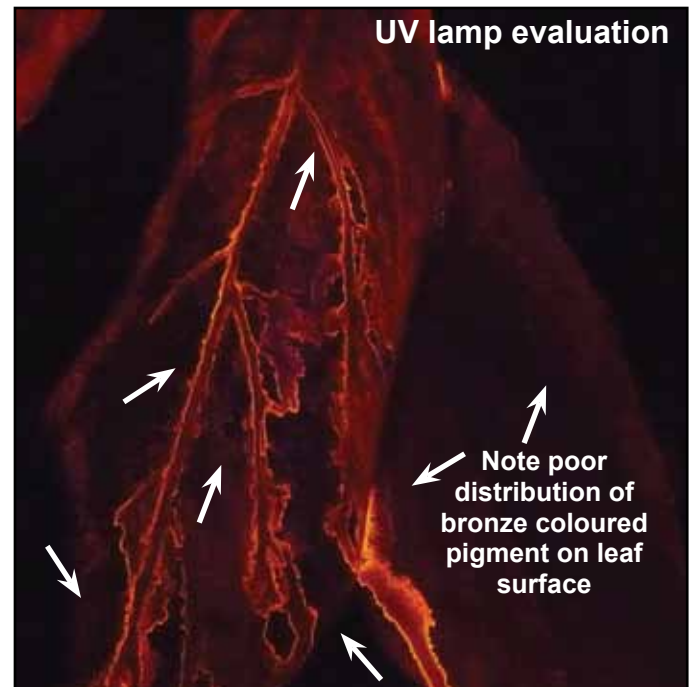
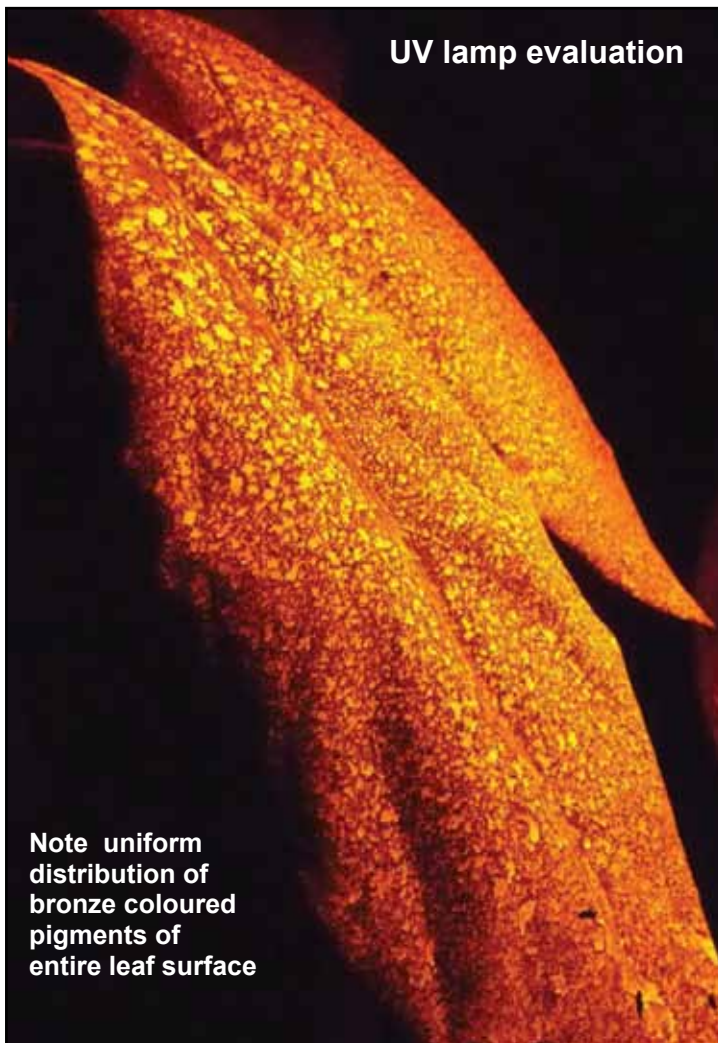
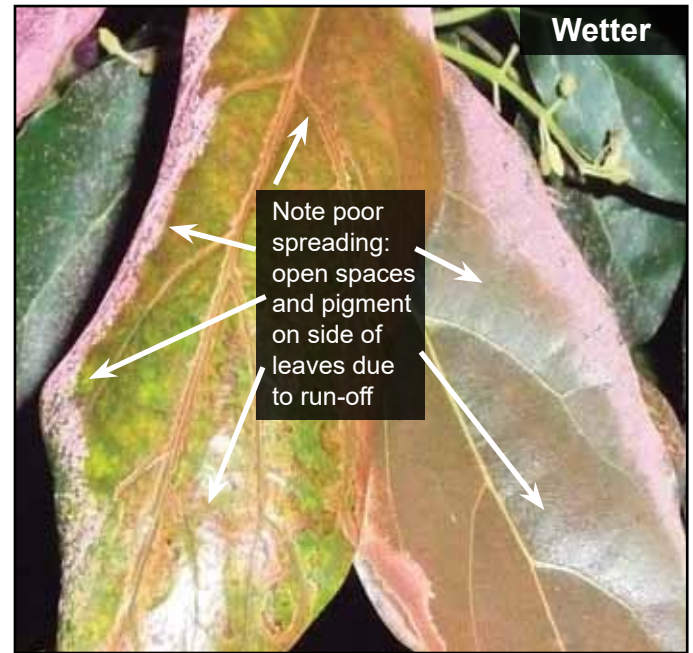
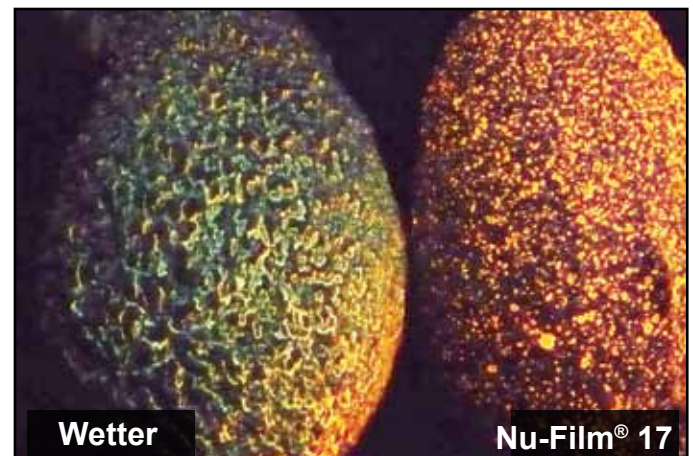


Photo below: Avocado fruit under UV light. Note improved (more uniform) spreading of UV sensitive pigments on fruit where Nu-Film® 17 was applied.



Photos from a field evaluation. Nu-Film® 17 and other wetting agents in water (with UV sensitive dye) were sprayed onto avocado trees. Deposition and spreading were visually evaluated with and without a long wave ultraviolet lamp. Photos include examples of leaf and fruit coverage by Nu-Film® 17 in water, as well as an agricultural wetter in water. Evaluation conducted by Miller Technical Department, Mexico.

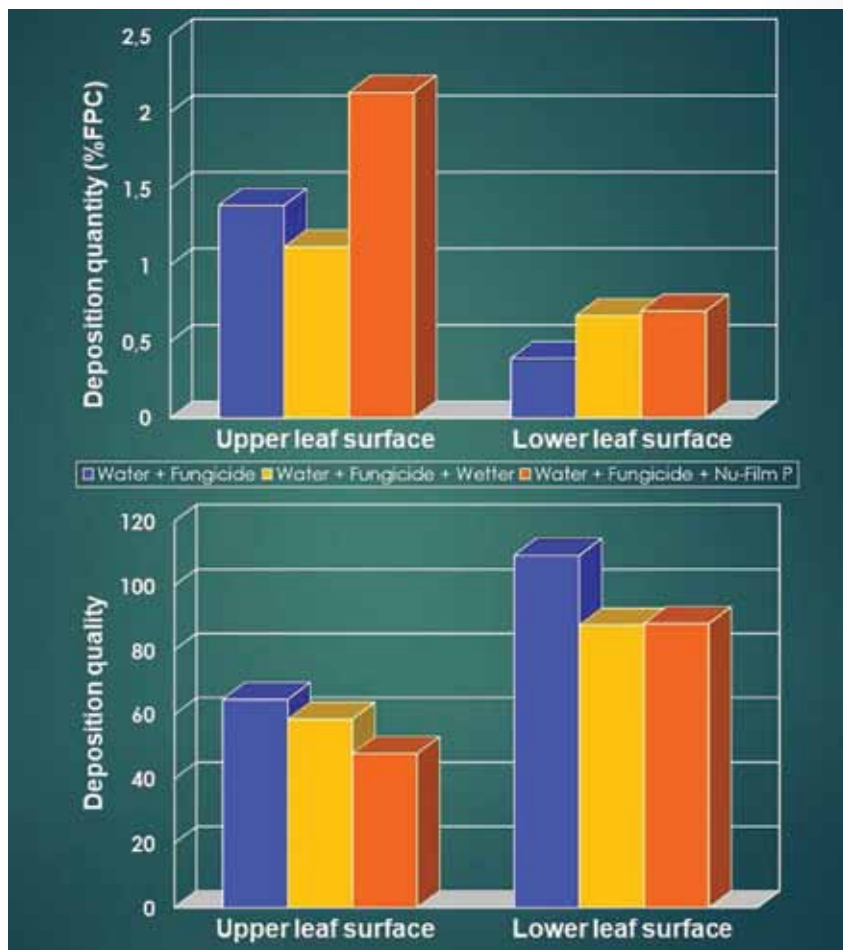
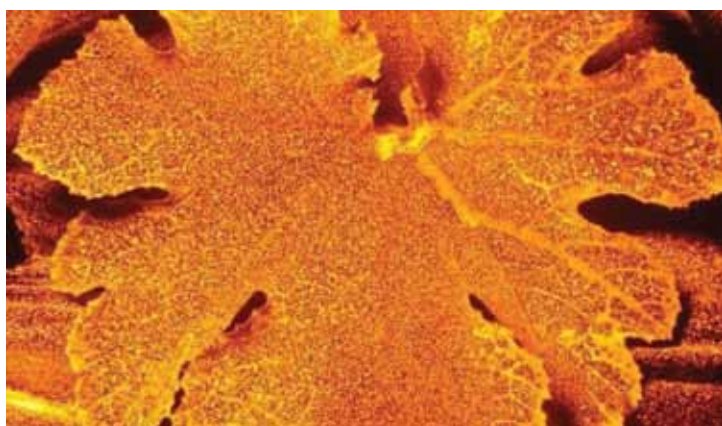


Figure 2: Graphic summary of median values for deposition quantity (% fluorescent pigment coverage - %FPC) and deposition quality (pixel distance between particles; smaller values indicate a better quality spray cover) on upper and lower surfaces of Chardonnay grapevine leaves following a spray application @ 526 L water/ ha. Study conducted by University of Stellenbosch.



Photos illustrating the application method (left) of UV sensitive dye and monitoring thereof (right) under UV light



Photos under UV light of more examples of excellent uniform spreading where Nu-Film® P was applied on squash (left) and tomato (right). Evaluation conducted by Miller Technical Department, Mexico.

Should you wish to attain more information regarding the Nu-Film®, please contact your nearest Hygrotech branch or johannvdv@millerchemical.com

REMEMBER TO INCLUDE **RIMEMBER !**

RIMEMBER beans were planted together with a competition variety at LA Farms, KZN. Mr. Louie Gounden said the variety is about a week earlier than other varieties. It has a glossy medium to dark green fruit, the pods are straight and 12 – 13 cm long. This variety has excellent tolerance to antracnose and rust.

Retailers have been repeatedly asking for the glossy beans, now known as the 'Mr. Min' beans. The pods are absolutely straight with a very high gel content, as a result seed development is very low. The average yield at LA Farms is around 11 tons per ha. Growers have been enquiring more and more about **RIMEMBER** bean variety.

So, remember to include **RIMEMBER** in your next planting and see the difference especially during marketing !

TECHNICAL INFORMATION

- **RIMEMBER** is a mid-early variety.
- It fits in with the medium / fine segment.
- It has a very uniform pod setting and high yield potential.
- The Rimember plant type is rather compact and erect.

Suitability: Fresh market and processing
Type: Fine Bean
Pod Length: 11-13 cm
Pod Diameter: 8-10mm
Pod Colour: Plain dark green
Disease Resistance: BCMV, Ua

DISEASE PACKAGE

Psp = Pseudomonas syringae phaseolicola (race 6) (Halo Blight);
BCMV = Bean common mosaic virus; **Ua** = Rust (many prevalent races)

A beautiful field of Rimember beans in the Umkomaas Valley

NEW GENERATION MELON AND WATERMELON CULTIVARS IMPRESS GROWERS !

The melon and watermelon industries, like many others, are in a continuous process of improvement in terms of fruit quality, yield, disease resistance, eating quality, shelf life and other beneficial attributes!

This past season many large semi commercial trials were planted in different climatic and geographic conditions at different times of the year to give maximum exposure to these varieties firstly, and secondly, to make sure all future recommendations regarding the planting seasons and expected outcomes are as accurate as possible.

The first results are in and the positive feedback is an indication of huge potential for the growers, Hygrotech and Seedcor.

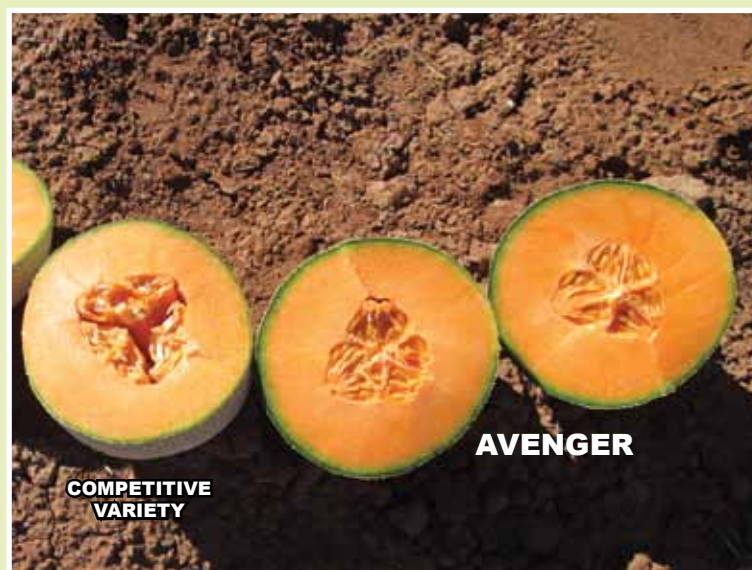
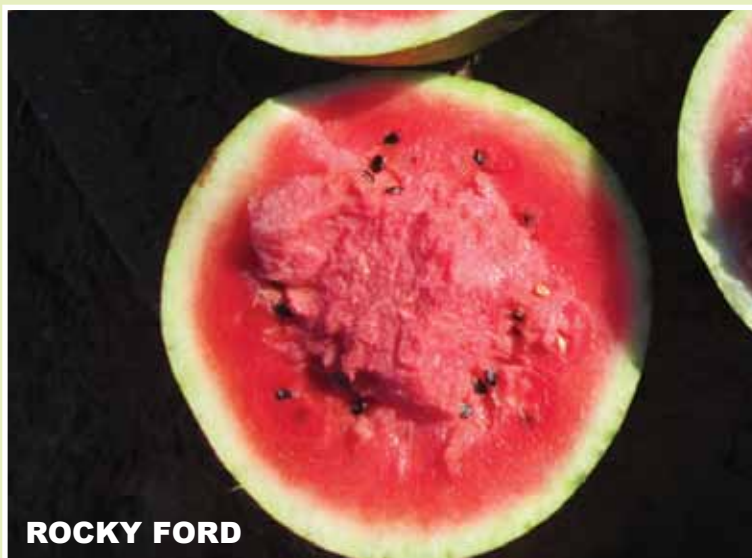
MELONS

Two new Harper types were included in trials which also included the standard variety in the industry. **AVENGER** average fruit weight 2.5kg, and **HUNTER** average fruit weight 2kg, stood out. Both varieties have an excellent disease resistance consisting of PM 1&2, fus 0,1&2. Both these varieties outperformed the standard variety in terms of shelf life, internal colour, smaller seed cavity, vigorous plant habit and general plant health.

In general terms the Harper types outperform the Easter Shipper types with more vigorous growth and fruit setting ability !

WATERMELON

Hygrotech has recently expanded its watermelon range with the addition of an Anthem type, **ROCKY FORD**. Extensive trials are currently in process in the Western Cape. In comparison to the industry standard, this variety stood out in terms of flesh colour (deep red), crisp flesh and a very acceptable brix of 12.5° and fruit size 12 – 15kg guaranteeing the consumer an unique and satisfying eating



experience ! Impressive disease resistance package of fus 0 & 1 and Anthracnose 1&3 with some tolerance to WMV and ZYMV.

In the coming months Hygrotech will be visiting YOUR FARM to introduce these new varieties to you!

In the interim, please feel free to contact either
Hugo Burger hugo@hygrotech.co.za and/or
Christo Le Grange christo.legrange@hygrotech.co.za
for more information !

EXCITING NEW APPROACH

Open field production of **Tomato Batyla** on Rootstock Simson in Komatipoort

Written by: Michael Luttig – Area Marketing Manager: Nelspruit

Previously not considered cost effective, Gustav van Veyeren from Winkelhaak Boerdery pioneered a new open field approach for Komatipoort in the Onderberg area by successfully planting Tomato Batyla grafted on rootstock commercially for the past 3 years.

In Komatipoort, agricultural land for vegetable production is expensive and scarce and has to fit in rotation cycles with Banana and Sugar cane and available fields are sometimes replaced by tree crops such as Citrus, Mangoes and Lychee. Often, the available vegetable production fields have to be re-used resulting in the accumulation of soil borne diseases such as bacterial wilt, Fusarium wilt and Phytophthora root rot and high nematode counts in the sandy soils.

The Hygrotech team, with Gustav van Veyeren and stake holders in the industry, showed that with a fresh approach of available technology, grafted open field tomato production can be profitable in Komatipoort. In addition, by promoting products such as Perlka and rotational crops such as Sunhemp and Mustard Caliente to break the disease cycle and reduce the nematode pressure, optimal tomato production can still be achieved.

Tomato Batyla as cultivar of choice

Over many years Winkelhaak Boerdery owner, Gustav van Veyeren, with guidance from Hygrotech representative Willie van Heerden, evolved from a mix vegetable grower to a specialized open field tomato producer for the fresh market.

Because tomato **Batyla** was known to produce a round shaped fruit of 150 - 170g with excellent firmness, colour, uniform ripening with a long shelf life, this variety was among several varieties selected and planted in 2010. **Batyla** stood out in a comparative shelf life experiment and variety trials in 2010 and variety trials in 2011 at Winkelhaak Boerdery. Based on this data, **Batyla** is the tomato variety of choice at Winkelhaak to this day, with less than 5% waste through the state of the art pack

Photo 1: Beautiful round shaped Batyla fruit of 150 - 170g with excellent firmness, colour, uniform ripening with a long shelf life.



house due to the excellent fruit quality and an average yield as high as 150 tons per hectare recorded in some years.

The **Batyla** plant is well adapted for cultivation in Komatipoort. In the humid, hot climate with mild winters of Komatipoort, the indeterminate round tomato **Batyla** with its vigorous indeterminate plant habit with medium compact internodes and good resistance to TYLCV (white fly transmitted), performs well with no pruning in the open field.

Batyla has resistance to: (HR) Tomato Masaic Virus (ToMV), Verticillium Wilt (Va/Vd), Fusarium Wilt (Fol:0,1), Tomato Spotted Wilt Virus (TSWV), Nematodes (Ma/Mi/Mj), Tomato Yellow Leaf Curl Virus (TYLCV) (IR)

Rootstock trials: Tomato Batyla on Rootstock Simson grafted transplants in the open field

As **Batyla** plants were lost from wilting due to a soil borne disease complex which include bacterial wilt and Fusarium wilt at Winkelhaak, a next level approach was needed such as the use of a rootstock with a "bullet proof" disease package, to ensure the continued use of **Batyla** with its excellent fruit quality characteristics.

The outcome of the trial was so positive with no plant deaths, that since 2015 grafted **Batyla** tomato transplants were planted on a large scale in the open field at Winkelhaak Boerdery, which combines the high quality fruit of **Batyla** with the disease, stress tolerance, and vigour of modern rootstock cultivars.

Rootstock tomato **Simson** from trials conducted by Hygrotech at Multiplant, Brits (The Forum, Volume 2, 2015, p6-7) were tested at Winkelhaak Boerdery during 2016. During 2017 tomato **Batyla** on Rootstock Simson were commercially planted at Winkelhaak in open field plantings resulting in high yields over a long period (planted 15/03/2017; harvested until Nov 2017), while some plants in adjacent blocks with non-grafted **Batyla** wilted and died (see photos). This was no small feat as tomato production was done with water limitations, disease pressure, Tuta absoluta damage and heat waves in late winter of above 40°C.

Rootstock Simson has resistance to: Verticillium Wilt Race:1 (V), Fusarium Wilt Race:1-3 (FFF), Root Knot Nematode (N), Tomato Masaic Virus (T), Fusarium Crown Rot (Fc), Phytophthora Root Rot (Pr) and tolerance to Bacterial Wilt (Bw).

Contact your nearest Hygrotech representative for more information on Rootstock Simson.



Photo 2: During 2017 tomato Batyla on Rootstock Simson were commercially planted at Winkelhaak in open field plantings



Photo 3: Two months after transplant: (Top) Batyla on Simson rootstock and (Bottom) Batyla not grafted, with plants already wilted or dead.



ZAR SEED PRODUCTION ON THE MOVE

Hygrotech's seed production company ZAR Seed Production (Pty) Ltd, a fully owned subsidiary of Hygrotech Properties (Pty) Ltd, has been involved in vegetable and grass and pasture seed production for 17 years.

ZAR Seed Production has seed cleaning, grading equipment and storage facilities at their Kroonstad facility in the Free State province.

Volumes of locally produced seeds, more specifically hybrid Sorghum Sudan, oats, stooling rye, dried beans, garden beans, garden peas, lucerne and perennial subtropical grasses have grown steadily over the past 10 years and together with growing volumes of hybrid and OP onions, leeks, carrots, beetroot, various cucurbits, and paprika, seeds have recently reached the 1000 ton mark and will be increasing to 1,250 tons during the 2018 – 2019 crop year.

ZAR Seed Production has been doing contract growing of processing garden peas for the South African freezing and canning processors and recent developments indicated that contract growing will materialize within the next 2 – 3 years which will bring valuable export foreign currency to the South African economy.



- A. Beautifully set, fat and healthy pea pods that have a yield potential of 4 000 kg processed and clean seeds per ha.
- B. Perfectly developing pea seed crop that will dry off and be ready for harvesting in December 2017.
- C. Luhan Swart in a 55 ha field of processing peas for seed.



BUILT ZAMBIA TOUGH



A recent visit to Zambia drove home two facts:
1. Zambia is a complex environment with its own economical, climatic and operational challenges,
and 2. rules do not apply, be it on the road or on the farm!

Hygrotech Zambia hosted two very successful farmers days in Makushi and Chisamba with over 30 farmers attending these days. On the drive up to the venues and talking to farmers beforehand it became clear that whatever preconceptions one has of the country and their farming practices are nul and void. For one, Zambia farmers have a much harsher economy to sell into with inputs being in most cases double that of South Africa, and income being the exact opposite thereof. Despite this Zambia farmers are some of the friendliest people you will come across and their technical knowledge and out of the box thinking were a breath of fresh air.

Zambia, despite having very high rainfall, receives the total of 1000-1200 mm all within five months from Mid-November to March on light sandy soils with dense bushveld. Thus meaning farmers have a very short window in which to bulk up for the harsh dry season. As such they are left to resort to some very creative strategies, some of which are



sure to find favour among South African farmers. Stock farmers are limited to natural grazing and browsing, some row cropping possibilities and cultivated pastures. Due to their poor maize price and very high input cost most stock farmers are turning over fields to cultivated pastures, further limiting their options. Such pastures then have to yield huge tonnage in a short window, with limited inputs whilst still producing very high quality hay/silage.

Crops such as Hypearl Millet and Kow Kandy have been used with success due to their low input costs and flexibility of use as grazing, hay, or silage. Giant Rhodes grass is a staple as it produces higher tonnage per hectare under high rainfall compared to the more common Katambora. Hygrotech is in the process of sourcing new material specifically for this purpose. Such pastures are then fortified with legumes as in the case with our host, Mr Paul Dobson, who runs a herd of Boran on his mixed pastures. The Stylo not only increases yield, but improves protein percentages significantly especially when pastures are ensiled or cut as hay. In recent years Stylo seed has been very expensive and we are sourcing new material that will be more suited to the climate and price requirements of these farmers.

In this case we also recommended trying a method that was pioneered by Umpukane Bonsmaras more than 10 years ago, where veld was fortified with Arrowleaf clover to get similar results. Seed was either planted or fed to animals and cultivated in this manner. We are keen to put in trials on both principles and hope to return positive results. The veld and climate resembles that of Northern Transvaal bushveld and for this reason other grasses were also recommended. Again trials will be put out to test viability.

En route we stopped at Zambeef's newly planted 50 ha pivot of HL 10 lucerne. Despite only being due for its second cut, the block looked in top shape. Zambeef follows a stringent fertilizer programme complete with Hygrotech products such as Asco grow, Phosfaspray etc. and the results speak for themselves. Lucerne is not favoured in Zambia due to the preconception that the specie does not persist very well and farmers are not able to take off enough tonnage. With fine tuning of cutting intervals we are a confident that Zambeef will not only catch up on the lost cuts but will also have this field performing well for many more years to come.

Hygrotech Zambia has renewed its focus on forage and pastures and we would like to show our commitment by assuring all our valued clients, old and new, that Hygrotech Zambia will put in the necessary effort to build on the old faithful products, as well as trial and develop new products suited to your climate and conditions. Keep up to date with developments by contacting our branch in Lusaka or Philip Lochner on +260966233019

KNOW OUR PEOPLE



New Appointments



ST van der Merwe

ST joined Hygrotech in October 2017 and is based in Gauteng.

He has been appointed as the Junior Product Development Specialist within the Gauteng Region. ST will assist Christo le Grange on all development work on vegetables seeds within the Gauteng region.

CONTACT DETAILS:

Email: st.vandermerwe@hygrotech.co.za
Cell : 073 011 9273
Extension: 8031

Lodewyk van Staden

Lodewyk joined Hygrotech in September 2017 and is based in Nelspruit.

After completing his studies at the University of the North West, Lodewyk joined the Alliance Seeds team. He gained valuable experience during his years at Alliance Seeds and has decided to join the Hygrotech family. Lodewyk will be working under the watchful eye of Michael Luttig, the Area Marketing Manager of Nelspruit.

CONTACT DETAILS:

Email: lodewyk.vanstaden@hygrotech.co.za
Cell nr: 082 926 3450



Welcome on board to all our new employees. We trust that you will have a fruitful and productive future at Hygrotech!



Henno Breytenbach

Henno joined Hygrotech in September 2017 as Sales Representative for the Bushveld Region.

Henno is well known to the Hygrotech bushveld customers as well as our product range as he farmed within the region.

CONTACT DETAILS:

Email: hmlboerdery@gmail.com

Cell : 082 729 0675

Johan(Tank) Hendriks

Tank joined Hygrotech in September 2017 as Sales Representative for the Bushveld Region.

Tank has been working in the agricultural industry for a number of years and has previously worked for an international vegetable seed company, Nickerson Zwaan.

CONTACT DETAILS:

Email: tankhendriks@hotmail.com

Cell : 076 649 5220



Promotions



Christo le Grange

Christo started at Hygrotech as the Product Development Manager for the Central and North Regions for all Onions, Cucurbits and Peppers. In July 2017 Christo was promoted to the National Product Development Manager for the Hygrotech Group. Christo is based at Hygrotech Head Office in Pretoria.

He started his agricultural journey at Starke Ayres in 1993 and has since gained valuable experience within the vegetable industry. Before joining Hygrotech, he managed Premier Seeds International as their General Manager.

We would like to congratulate Christo on his achievement and wish him all the best.

CONTACT DETAILS:

Email: christo.legrange@hygrotech.co.za

Cell: 078 052 3186

Extension: 8035



EMPLOYEE FOCUS



Dr Martin Maboko

Dr Martin Maboko

appointed as Hygrotech's National Group Horticulturist

Dr Maboko completed his BSc. Agric. (Plant Production) at the University of Limpopo (1998-2002). He then furthered his studies at the University of Pretoria (2002-2006) where he completed his MSc. Agric. (Horticulture) and then completed his PhD (Horticulture) with University of KwaZulu-Natal (2010- 2014).

Dr Maboko has been a researcher at the Agricultural Research Council – Vegetable and Ornamental Plants, Roodeplaat for the last 13 years, specialising in hydroponic vegetable production and field vegetable crops. Dr Maboko has a “Y” rating with the National Research Foundation (NRF).

He has published scientific papers which can be accessed in the link https://www.researchgate.net/profile/Martin_Maboko and co-supervised 7 master’s degrees.

He successfully provided support services to extension officers and smallholding farmers on hydroponically and field grown commercial vegetables.

CONTACT DETAILS

✉ martin.maboko@hygrotech.co.za

📞 083 752 5787

☎ 012 545 8053

📍 **Head Office**
1 Gerard Braak Street
Pyramid, 0120
Tel. 012 545 8000
Fax. 012 545 8088

Green Bean Christmas Stew



Green bean stew is a firm family favourite, not only in my home, but in kitchens all over South Africa. Especially during Christmas time when families spend time together.

Ingredients

- 1 kg lamb – knuckles, neck or rib cutlets
- 2 medium onions – chopped
- 2 cloves of garlic – chopped
- 1 tsp dry coriander
- 250ml mutton stock
- 5 large potatoes – cut in big chunks
- 1 kg frozen or fresh beans – trimmed and cut
- salt/pepper
- juice of 1 lemon
- cooking oil



Method

Preheat the oven to 180C. Season the meat with the dry spices, salt and pepper. Heat the Dutch oven on the stove and add the oil. Brown the meat on all sides, add the chopped onion, garlic and stock. Cover the pot with the lid and cook for 1 – 1 1/2 hours. Check halfway through the cooking time and if it needs more stock or water, add a little. After this time in the oven, you can add the potatoes and the green beans. Add a little salt for the vegetables. Place back in the oven and cook for another 40min. Take the pot from the oven and finish the stew off on the stove top. If there is too much liquid left, cook for a while with the lid off. Take a potato masher and mash some of the potatoes to “bind” the stew. I like to keep some potatoes whole. Add the lemon juice and lots of black pepper and voila your delicious Green Bean Stew is ready.



Seasons Greetings!

**Have a loving and
peaceful Christmas
period and a
prosperous
new year**



From all of us at Hygrotech



SA (EDMS) BPK * (PTY) LTD

Reg. no. 1973/013885/07

1 Gerard Braak Street, Pyramid 0120 | P.O.Box 17220, Pretoria North 0116
South Africa Phone: +27 (0) 12 545 8000 | Fax: +27 (0) 12 545 0150