

# ucf Undercover farming

MAY/JUNE 2024 | VOLUME 21 NO 3 | ★★★★★ | R45.00 PER ISSUE



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die pols van landbou



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SCRIPTURE



**2 Corinthians 9:6-15**

Remember this—a farmer who plants only a few seeds will get a small crop. But the one who plants generously will get a generous crop. You must each decide in your heart how much to give. And don't give reluctantly or in response to pressure.

ucf **Undercover** farming

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And so, winter arrived with all its pros and cons – whatever your profession or even health situation. Thank heavens for climate changes throughout the year! How drab would life have been with only one climate globally. With winter on hand, producers must alert their greenhouse workers on what the change in weather holds in for the welfare of the greenhouses and its plants, but also their personal health. In this edition we publish a wide variety of topics that are of current importance to greenhouse farmers. I am currently in Ontario, Canada, and with news around here, somehow find very similar situations that we in South Africa must contend with. Their electricity or gas supplies to maintain optimal growing conditions and drive water pumps are pricewise, rocketing. Their operating costs increases dramatically as cost of delivery by road increases almost monthly. We visited a few supermarkets to view prices and were shocked at what they pay for a kilo tomatoes, etc against us in SA. The best prices to purchase are found at the few Mennonites farm stalls around St Jacobs in Ontario. Therefore, let us in SA stop wailing, look at our management as far as financial management is concerned, put a high premium on worker training and spot checking, as well as their sanitary and safety requirements. All these should have you sleep in peace, knowing you are doing all you can to run your business well!

# UNRAVELING THE POTENTIAL OF MASSILIA RZ F1

## Empowering Growers through Resilience and Quality

Massilia RZ F1 emerges as a leader in the pepper realm for growers worldwide. Boasting a plethora of resistances and exceptional traits, this variety not only promises bountiful yields but also offer resilience and quality.

### Empowering Growers: Unveiling Massilia RZ F1

Massilia RZ F1 stands as a testament to the pursuit of excellence in plant breeding. With its early maturity and robust growth habits, it assist growers to navigate the intricacies of modern agriculture with confidence and ease.

### Early Variety with Good Cover

The early maturity of Massilia RZ F1 ensures a quick turnaround from planting to harvest, allowing growers to optimize their production schedules and capitalize on market demand. Additionally, its good cover provides protection against adverse weather conditions, ensuring consistent growth and development throughout the cropping cycle.

### Vigorous Compact Plan

Characterized by its vigorous and compact stature, Massilia RZ F1 exhibits growth vigour, maximizing space utilization and promoting efficient resource allocation.

This compact plant type not only facilitates ease of management

but also enhances airflow and light penetration, fostering optimal conditions for robust plant growth.

### Resilience Against Cracking and Star-Cracking

Cracking and star-cracking pose significant challenges to pepper growers, leading to losses in yield and quality. However, Massilia RZ F1 stands strong against these threats, thanks to its inherent resilience and structural integrity. By mitigating the risks associated with fruit cracking, it ensures a consistent supply of high-quality peppers, bolstering economic viability for growers.

### Unlocking Potential: Harnessing the Benefits of Massilia RZ F1

Beyond its remarkable growth habits, Massilia RZ F1 boasts an impressive array of resistances and traits that elevate it to a league of its own, setting new standards for pepper cultivation.

### High Yield of Uniform Fruits

Central to the appeal of Massilia RZ F1 is its ability to deliver consistently high yields of uniform fruits, characterized by deep red coloration and impeccable shape. This uniformity in fruit size and quality not only streamlines harvesting and post-harvest handling but also enhances marketability, ensuring premium prices and consumer satisfaction.

### Compact Plant Type for Versatility

The compact plant type of Massilia RZ F1 offers versatility in cultivation, catering to diverse farming systems and environments. Whether grown in greenhouse settings or open fields, its adaptability ensures optimal performance, regardless of growing conditions. This versatility empowers growers to explore new avenues of production, expanding their horizons and unlocking untapped potential.

### Maximizing Success: Strategies for Growers

As growers embark on their journey with Massilia RZ F1, a myriad of strategies can be employed to maximize success and capitalize on its full potential.

### Optimizing Crop Management Practices

The key to unlocking the full potential of Massilia RZ F1 lies in optimizing crop management practices. From timely irrigation and fertilization to judicious pruning and trellising, attention to detail is paramount in ensuring optimal growth and development. Moreover, regular monitoring for pests and diseases enables early detection and intervention, safeguarding crop health and productivity.

### Harvesting and Post-Harvest Handling

Harvesting peppers at peak ripeness is essential for preserving flavor and quality. With Massilia RZ F1, growers can expect a uniform ripening pattern, facilitating efficient harvesting and post-harvest handling. Prompt cooling and packaging further extend shelf life and maintain product freshness, ensuring maximum market appeal and consumer satisfaction.

### A Bright Future for Pepper Cultivation

As we navigate the complexities of modern agriculture, the role of resilient crop varieties like Massilia RZ F1 becomes increasingly indispensable. With its early maturity, broad resistance pattern, and exceptional fruit quality, it holds the key to unlocking new horizons for growers worldwide.

By harnessing its potential and embracing innovative farming practices, we pave the way for a future where sustainability, productivity, and prosperity converge, shaping a brighter tomorrow for generations to come. 🌱

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**Francois Kruger**  
**f.kruger@rijkszwaan.co.za**



# Massilia RZ F1

## Blocky Sweet Pepper

HR: Tm:0-2

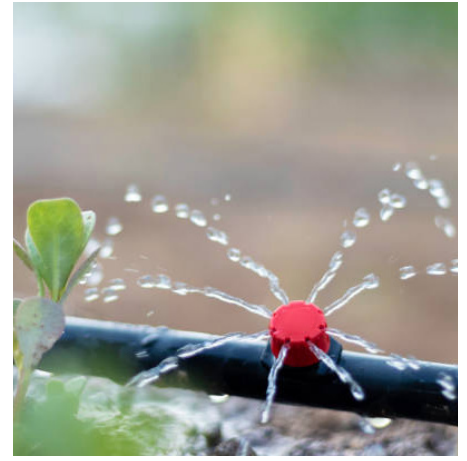
IR: TSWV:0/Lt/Ma/Mi/Mj

Nematodes and PM resistance, Fruit size uniformity in time, Compact plant type, All round variety.

For more information contact: Francois Kruger - 076 152 8411

[www.rijkszwaan.co.za](http://www.rijkszwaan.co.za)





# PROPER IRRIGATION practices in media culture

One of the key facets of hydroponic culture, yet also one of the biggest causes of problems that one comes across on farms on a regular basis is the lack of understanding of the principles of good irrigation.

The industry, like all other industries these days, is under continuous pressure to increase production while facing continuously rising input costs, yet many growers continue to irrigate in ways that do not promote good production.

The pot culture system such as that used by most tomato, sweet pepper and cucumber growers in South Africa may be outdated, but that doesn't mean that good yields cannot be achieved using this system, provided good irrigation practices are used in conjunction with good equipment and a good growing medium.

So why can't we just irrigate with a clock timer at predetermined intervals which are altered on a seasonal basis to achieve a targeted overdrain percentage?

The reality is that plants do not take up water like clockwork and can vary this uptake substantially on a day-to-day basis. For example, mature tomato plants can take up 2 500ml one day and 300ml the next as the weather changes. Manual

adjustments cannot adequately compensate for this, with the result that plants are often too wet or too dry, at the wrong time of the day, and production losses are inevitable. Also, it becomes very difficult to manage EC.

The uptake of water is strongly correlated to light intensity and accumulated light energy and is influenced by temperature, humidity, air movement and the leaf area of the plant. Using a solarimeter to assist your irrigation controller is a reliable means of scheduling irrigation to coincide with the prevailing light conditions, by far the largest determinant of water uptake, and using a reliable water content meter or, alternatively, a scale system which weighs the bags continuously will complete the picture.



This does not have to be an elaborate, expensive system and can either be a scale hooked up to a computer for logging purposes or a simple one with a digital display which can be read at certain times of the day.

Knowing what is going on in the bags or slabs is one of the mysteries of hydroponics, yet managing water content is one of the few things over which we can have complete control. One just needs to have the right tools.

Using the tools mentioned above, you can make important decisions as to when and how much irrigation is required on a day-to-day basis, as well as refining your general irrigation strategy for the steering of your plants. 📌

**By: Martin von Holdt**



# OPERATING A PROFITABLE AQUAPONICS SYSTEM



An aquaponics system offers extra products at less expenditure; or so we are informed. In this editorial the reality of proper management to ensure that is outlined.

Somebody quoted: 'The company with the smaller margin at the same price will usually loose'. Stated differently, the company that maintains the tightest OPEX (operational expenditure) control will win.

## Managing costs

The relevance of this to greens producers in Aquaponics is that they need to keep costs down wherever possible. This starts with a workable design that is economically effective so that money is not wasted on unnecessary components or on inefficiencies. The benefit of buying a known system or erecting a system that duplicates one that is already operational is apparent. Once the facility has been erected it must afford the opportunity to be

operated cost efficiently; do not lift the water 2m if 1m is adequate, do not use 2 pumps if 1 can do the job.

## Optimising

The rafts and beds need to be always kept full of crops, the tanks full of fish and all need to be growing optimally. A 10% reduction in growth rate or 10% empty beds essentially mean a 10% reduction in income over time, without a commensurate reduction in OPEX. Part of this focus must be to control pests and the impact they have on production rates and volumes. One should also manage theft closely as this is an economic killer.

## Marketing

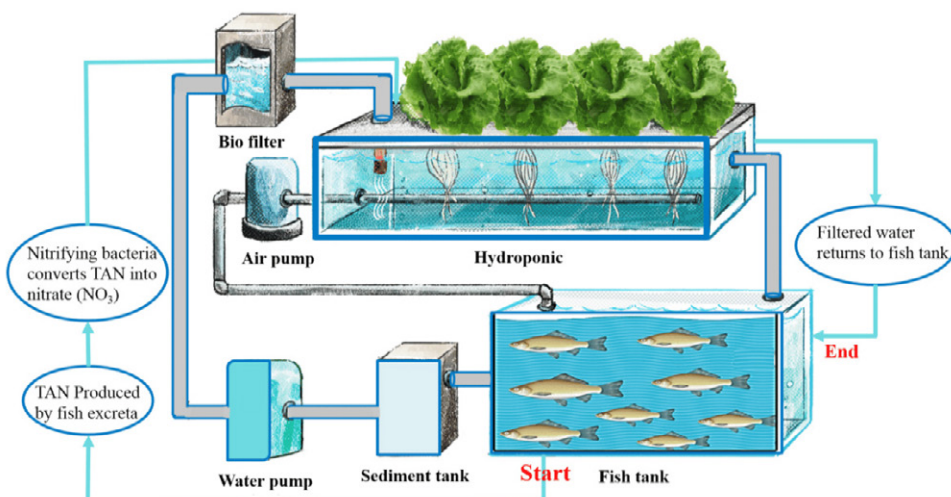
In the marketplace we need to be sure that we get the best possible price for every leaf. Different packaging options provide a range of opportunities to sell your crops, thereby increasing your market share. Lettuce can be sold as whole, living lettuce or as leaves in a bag or

combined with other herbs as a salad mix.

## Competition

The aquaponics producer will most likely find the market to be a competitive environment. Make the most of the natural advantages offered by aquaponics being a natural and wholesome method of crop production, resulting in the most wonderful flavours. If you can command a premium over other production methods (this is not uncommon for aquaponics crops), this is a game changer as it automatically increases your margin.

🔴 **By: Leslie Ter Morshuizen**



The schematic illustration above portrays the basics of aquaponics farming. Systems may be adapted according to the producer's requirements.

Close-up picture of a Red Spider Mite on a tomato plant's leaf.



The scary Red Spider Mite – it causes speedy losses of crops if not scouted and controlled early.

# COMBATting RED SPIDER MITE on Tomatoes in the Greenhouse – Prevention is better than Cure!

The Red Spider Mite - also known as the 'Two Spotted Spider Mite' - is one of those greenhouse pests that can be quite common on tomatoes grown under protection. Unfortunately it can also prove quite difficult to control.

Like the whitefly this is another fast-colonising pest usually found on protected crops. The red spider mite is a tiny wingless insect - up to about 1 mm long - with eight legs and a one-piece body. Young and adult mites feed on the leaves extracting sap and soft plant cells.

The first sign of a red spider mite infestation are either small spider webs - often high up on the plant - or white speckling on the upper surface of the leaves. As the attack progresses, they take on a bronzed appearance and may wither and die. Fine webbing is produced, strung between parts of the plant or under the leaves.

Using a magnifying glass the red spider mite and their eggs can be seen on the undersides of the leaves. In an unheated greenhouse the worst attacks occur



Heavily Red Spider Mite infestation on tomato plants in a greenhouse.

from December to March, but red spider mites can be active year round. Serious damage to the plant is only done when population numbers dramatically increase resulting in leaf, flower and even fruit loss.

Of the dozens of different plant parasites which may plague tomatoes in a greenhouse, one of the most infamous, talked about, and feared is *Tetranychida urtica* — more commonly known as the two-spotted spider mite, or red spider mite. As luck would have it, these arachnids are also among the most common pests in indoor gardens. They are found everywhere. Native to Eurasia, they can now be found worldwide, particularly in controlled agriculture settings.

Although the mites' initial assault may seem innocuous, their tiny size and ability to reproduce very quickly compounds the issue. As the pests themselves are difficult to spot, a grower can easily miss the subtle signs of initial infestation if he or she does not closely inspect their greenhouse each day. A less vigilant grower might overlook these signs until leaves are already yellowing, dying and dropping off and the plants are covered in highways of webbing, not to mention hundreds or thousands of very mobile, very hungry mites.

Since we understand that spider mites are common, elusive, and destructive, the question arises, how do you get rid of spider mites? Or better yet, how do one prevent spider mites from infiltrating greenhouses in the first place? If you are diligent about prevention,

eradication may not be necessary. Mites are generally brought into the greenhouse by none other than the workers. Mites can ride in on clothing, hair, or any outdoor materials you bring in with you. For this reason, it is important to ensure that clothes, hands, hair, etc. are clean before entering the greenhouse – better still, to wear hygienic greenhouse apparel.

It is also important to know that mites can lie dormant when conditions are unfavourable, only to re-emerge when they think they may have a better chance at survival. When receiving any new seedlings, keep them in a separate quarantine area for the first week or two. This will keep any pests away from your greenhouse while you watch carefully for their appearance on your new seedlings. Check daily for any signs of pests like those shown in the image and treat if necessary.

In a perfect world, we would never have to treat for mites. Many of the greenhouse operators we talk to are currently fighting a mite population (again), or recently were. Most, if not all, have at one point or another.

## Using Insecticides

There are many sprays marketed mainly or solely for the eradication of mites. An insecticide (or biological control for optimum health purposes) for resistance management, would be a suspension concentrate acaricide and insecticide for the control of red spider mites and whiteflies in tomatoes.

## Delay insecticide resistance.

Avoid exclusive repeated use of



# PUTTING FOLIAR SPRAYS IN PERSPECTIVE



Greenhouse robotic spraying.

It is now known that not only nutrients can be foliar absorbed but also pesticides, growth regulators, organic acids and many carbohydrates. The main advantage of using foliar applied fertilizers is that they can be rapidly and effectively absorbed, ensuring a quick plant response. Because they are so effective they require less fertilizer input and bypass soil fixation and leaching.

Another advantage is the fact that they are effective when plants have a restricted root system, periods of environmental stress, seasonal root loss, periods of low photosynthetic output and a corresponding low carbohydrate reserve. Foliar applications of nutrients as a supplementary fertilizer are highly effective.

## FOLIAR ABSORPTION

Several factors which will affect foliar absorption include relative humidity, temperature, pH of the nutrient solution, variety, age of the leaf, concentration of the nutrient solution, difference in the nutrient compounds (formulations) use of surfactants and the addition of non-nutrient facilitating or carrier-mediated agents.

Humidity and temperature have a direct relationship with absorption

of nutrients and as they increase, penetration also increases. The total amount of time the nutrient is in contact with the leaf is critical. Optimum pH is a factor that varies from nutrient to nutrient and most good manufacturers / formulators recognize the need to have optimum pH for the nutrient used. Many chemical compounds are ineffective as foliar nutrients and thus only tried and tested products should only be used.

## MODERN FOLIARS

The efficacy of modern foliar fertilizers varies significantly and is directly proportional to the quality of the product. Using both organic and inorganic facilitating agents to transport the cations into and throughout the plants has become a very exact science.

Many humic and organic materials (notably amino acids) have the capacity to bind substantial amounts of metals and other cations, and they can therefore exert considerable control over the supply and availability of nutrient elements to plants. When the metal ion combines with an electron donor, the resulting substance is said to be a complex. If the donor atoms are attached not only to the metal ion but also to each other as well forming a ring, it creates a chelate.

The best chelating agents are those that are natural components found in the metabolism of the plant, such as carbon and amino acids.

When applying foliar fertilizer sprays containing the correct form of nutrients, this eliminates the limiting element and influences plant metabolism and photosynthesis. With enhanced photosynthesis the plant begins to produce more carbohydrates and, in the process, requires more water. The stomata on the leaf open allowing water vapor to escape, which reduces the water pressure in the xylem tissue allows more water to flow up the vascular bundle.

In turn more water is absorbed into the roots to replace the water moving up. If good nutrition is available in the soil surrounding the root, extra nutrients enter the plant with the water. If you visualize the plant as a water pump, the foliar fertilizer acts as a primer, priming the pump and bringing more nutrition into the plant. It is important to remember that the foliar fertilizer increases the total uptake of nutrients by several folds over the small amount of foliar fertilizer applied. 🍷

**By: Mike Haupt**

## ◀ 08

insecticides from the same insect group code. Alternate or tank mix with products from different insecticide group codes. Integrate other control methods (chemical, cultural, biological) into insect control programs. For specific information on resistance management contact the registration holder of this product.

An anti-resistance strategy in agricultural pests is very important. Use alternative products for the control of red spider mite and sucking pests in those areas where the cotton aphid has not yet developed

resistance to organophosphates.

## Importance of scouting

Make use of a scouting system and economic threshold values to determine when to commence application of a insecticide for insect and mite control in tomatoes.

Regular and a controlled scouting program will ensure the producer can act at the first sighting of red spider mite on his tomatoes and therefore save his entire crop.

## Method when spraying

When spraying, make sure to wet

the entire plant. Do not overdose by overlapping applications or by exceeding the recommended rate. Avoid spraying during the heat of the day or if foliage is wet. Allow 24 hours to expire between application and overhead irrigation.

It cannot be reiterated enough that prevention is better than cure. Also, should it be necessary to use insecticides to save the crop, especially in a controlled environment like a greenhouse, the assistants should be protected against the remotest form of poisoning. 🍷



**By allowing plants to take up the correct nutrients, this is the result a greenhouse grower can expect.**

# ALLOW PLANTS TO ORDER THEIR NUTRIENTS

**D**utch growers, who allowed nutrient rich water to run from their farms, were contributing to chemical pollution and the increased incidence of water weeds in their canals and rivers. Strict laws were introduced to decrease this environmental pollution, by restricting the release of nutrient-rich water from production units.

Due to intensive research projects on recycling, they succeeded to reach this goal in the year 2000. Two problems were solved in this process: The first was to monitor and adjust ions in the nutrient solution, and the second to sterilize the recycled solution. Sterilization options will be discussed in the next edition, allowing a few more words on the issue of plant nutrition here.

## **Prevent the accumulation of sodium (Na) and chloride (Cl)**

Feeding water with low Na and Cl levels must be used when nutrient solutions are recycled (closed system) in order to prevent the accumulation of these ions. The Dutch overcame this problem by building plastic lined reservoirs, filling it with rain water from their glasshouse roofs. By mixing Na- and Cl-rich water with rainwater, the Na and Cl concentrations were lowered to safe levels.

Since low EC crops such as roses can only absorb 5 ppm Na and 11 ppm Cl, these are the highest levels that may be allowed in the feeding water for roses in a 100% closed system. A saline tolerant crop such as tomatoes can remove 16 ppm Na and 32 ppm Cl, allowing tomatoes

to be recycled with feeding water containing these, or lower, Na and Cl levels. Should water with higher Na and Cl levels be used for a limited recycling period (until the red lights start flashing) saline sensitive crops should be flushed as soon as root zone levels reach 69 ppm Na or 107 ppm Cl.

Most greenhouse crops will be unaffected with Na levels below 115 and Cl below 178 ppm. Saline tolerant crops such as tomatoes will be able to withstand levels of up to 184 and 284 ppm Na and Cl respectively. Should these levels be exceeded, yield and quality losses will occur.

## **Adjusting nutrient levels**

As a crop develops from the vegetative to reproductive stage, or with a change in climatic conditions, its nutritional needs change. The use of leaf deficiency or toxicity symptoms to identify nutritional problems is ineffective. It is impossible to avoid yield and quality losses with this approach, even by using quick petiole sap measurements as aid. The use of nutrient foliar sprays should not be necessary.

Root zone analyses, developed in the Netherlands during the last few years, can help growers to identify nutritional imbalances before it is reflected in the leaves and before damage can be done to the yield potential. This procedure is used by the Dutch and the Belgians, serving areas with high densities of growers.

The laboratories send technicians to take root zone samples every week or two. The results and suggested changes to nutrient mixes are E-mailed to the growers the following day.

## **SA conditions**

The duplication of such a system under South African conditions may be impractical at this stage, but the same principles may be adapted to improve our nutrient managerial effectiveness.

A Root zone analysis is a must for recycling, but it can also be useful to optimise nutrition in a free-draining system.

The procedure starts with a chemical analysis of the root zone solution. One fresh sample from the drainage tank in a closed system, or a mix of 20 fresh sub samples, taken from growing bags in a drain-to-waste system, should be analysed at least monthly. Since changes in the ammonium: nitrate ratio may occur during storage, these samples should be analysed as soon as possible.

Apart from regular pH and EC checks, root zone analyses are used to detect deviations from preset root zone norms, thus, allowing the plants to communicate with their growers. Before this can be done, the EC and nutrient levels of the sampled solution should be adjusted to match the EC of the norm solution. This procedure is described in the book: *'Nutrient solutions and Greenhouse management'* only available from Dr. Nic Combrink: E-mail: njjc@sun.ac.za

# Spanish tortilla

## with chorizo, potato and Sweet Palermo

Here, we have a Spanish Sweet Palermo tortilla for you. Although it might seem easy, cooking a good tortilla actually takes a bit of experience. But don't let that stop you trying – because the more effort you put into making something, the more you enjoy the final result, right? This recipe uses chorizo, potatoes, a couple of Sweet Palermo peppers and of course plenty of eggs!

This Spanish tortilla is a hearty meal for one, but you can also serve it as a snack or appetiser for sharing with family or friends.

### INGREDIENTS

2 large starchy potatoes  
1 large onion  
1 clove of garlic  
1 red Sweet Palermo  
1 small yellow Sweet Palermo for the garnish  
4 tbsp parsley  
100 g chorizo

2 tbsp oil for frying  
7 eggs  
¼ tsp salt  
1 tsp mild paprika powder  
6 tbsp aioli (garlic mayonnaise)  
8 slices of baguette  
8 cocktail sticks

### PREPARATION

1. Peel and boil the potatoes until they are almost cooked. Drain and leave to cool, then cut into slices.
2. Finely chop the onion and crush the clove of garlic. Finely dice the red Sweet Palermo and chop the small yellow Sweet Palermo into rings. Then finely chop the parsley and slice the chorizo.
3. Heat the olive oil in a frying pan and soften the onion and garlic over a medium heat first. Then add the potato slices and fry until golden brown. Lastly, add the chorizo and diced red Sweet Palermo and continue frying for a few more minutes. Sprinkle with a little paprika powder to add flavour, stir through carefully using a wooden spoon and then reduce the heat.
4. Whisk the eggs together with 2 tbsp chopped parsley and a little salt, and then add the mixture to the pan. Put the lid on the pan and leave to cook over a low heat for 8 minutes. Use a large plate to flip the tortilla over and then cook the other side for a further 4 minutes.
5. Toast the slices of baguette until golden brown, then spread them with a little aioli. Garnish the tortilla with the yellow Sweet Palermo rings and the rest of the parsley. To serve, slice the tortilla into wedges and place one on each slice of toasted baguette, secured with a cocktail stick.



For more delicious recipes go to:  
[www.lovemysalad.com](http://www.lovemysalad.com)



Grolite supporting water filtration



# BOOSTING FERTILISER EFFICIENCY AND PLANT GROWTH USING HORTICULTURAL PERLITE

Increased fertiliser efficiency, together with effective water drainage and optimal soil aeration, are essential for increased productivity in the horticultural sector. Grolite® from Pratley is a unique, naturally occurring processed mineral used extensively as a horticultural growing medium.

Pratley actively processes a volcanic mineral called Perlite sourced from a unique deposit in South Africa. The ore is processed using proprietary technology to produce Grolite® for the horticultural and hydroponic industry.

“Grolite® allows for improved fertiliser efficiency, which boosts plant health and growth. It also promotes water drainage, while retaining the required moisture, leading to healthier plants and increased crop yields. In a water-scarce country like South Africa, this is vital to horticulturists,” Pratley Marketing Director Eldon Kruger comments.

Tiny micropores on the surface of the Grolite® particles assist in capturing nutrients and water molecules.

The capillary action occurring in the voids between the particles ensures uniform distribution of water and nutrients, which results in consistent and improved crop yields. Grolite® also maintains optimal soil aeration, a critical factor in normal plant growth. This is because the supply of oxygen to roots in

adequate quantities is essential for healthy plant growth.

Grolite® is processed at temperatures in excess of 950°C, resulting in a sterile product that is completely free of weeds and pathogenic microbes. Unlike other ordinary horticultural Perlites, the unusually strong surface structure of Grolite® means it does not deteriorate during transportation or when being mixed.

This unique feature means hydroponic farmers, for example, can reuse the product for more than one season, increasing its cost-effectiveness. “It’s a feature which is quite specific to Grolite®, as the Perlite raw material is from an



Organic methods ensure your veggies are free from harmful substances

Pratley Marketing Director  
Eldon Kruger



older deposit which is unlike perlite deposits found in other parts of the world,” explains Eldon.

Grolite® is available nationwide in various grade sizes to cater for specific blends. “Pratley experts are always on hand to discuss specific customer requirements, or to respond to any queries,” Eldon highlights.

Connect with us on our website:

[www.pratleyminerals.com](http://www.pratleyminerals.com)

Home veggie gardens contribute to food security for local communities



# GROLITE

## SUPERIOR PERLITE FOR HORTICULTURAL & HYDROPONIC USE

### Key Benefits:

- Increased fertilizer efficiency, which improves plant health and growth.
- Promotes water drainage whilst still retaining optimal moisture conditions in the root zone.
- Maintains optimal soil aeration.
- Free of weeds and pathogenic microbes (sterile).
- Compared to other ordinary horticultural Perlites, Grolite has a much stronger surface structure. This prevents damaging degradation and attrition during mixing and transport.
- Available in various grades to suit all growing requirements.



# GROLITE

## EXPANDED PERLITE FOR HORTICULTURAL & HYDROPONIC USE

GROLITE is a unique, naturally occurring mineral used extensively as a horticultural growing medium. Key benefits include:

- Increases fertilizer efficiency, which improves plant health & growth.
- Promotes water drainage whilst still retaining ideal moisture content.
- Maintains optimal aeration of soil.
- Free of weeds & pathogenic microbes.

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# PEAT-BASED GROWING MEDIA STILL AS POPULAR AS EVERYIELD

Peat-based growing material in seedling plugs.

*The use of peat as a substrate raw material in the production of growing media is indispensable for use in commercial horticulture and still popular in greenhouses in South Africa.*

Peat-based growing media offer unique crop security for the whole diversity of crop plants. Eliminating peat from growing media diminishes crop security. Of the huge areas of raised bogland that exist in the world, only a very small part is used for peat extraction. Intact bogs are nature conservation areas and are left untouched.

In line with the voluntary commitments made in the "Responsibly Produced Peat" (RPP), they obtain their raw materials exclusively from peat bogs that were drained decades ago, when this process was still the politically and socially accepted practice. More than 70% of their peat resources come from RPP certified extraction sites. This includes all sites in Lithuania as well as many important sites in Latvia and Germany. All RPP criteria were met for these sites.

The peat extraction areas are subject to very strict legal regulations, which stipulate the performance of re-maturation once peat extraction has ended. Through re-wetting, they convert former extraction areas into typical bog-like landscapes where peat moss can begin to grow again.

After being duly processed, the various peat types have optimum physical, chemical and biological plant cultivation properties which,

taken all together, cannot be matched by any other raw material. Other raw materials, such as wood fibre, compost and coco pith, form an excellent supplement to peat. But these materials only achieve their desired horticultural effect in combination with peat.

Raw peat materials are available in sufficient quantities to cover the world-wide demand for growing media. Ceasing to use peat in growing media would cause a gap in the supply chain. Alternative raw materials such as wood fibre and compost are not available in sufficient quantities to allow peat-free growing media to be produced on the required scale – neither for Germany, Europe or the world.

The supply of such alternatives

could also be still further diminished, and their price could rise, as they become increasingly attractive for energy uses in future. 15% Alternative substrate consists of raw materials - every substrate raw material causes emissions, though in different amounts. Peat is among the raw materials with comparatively high CO<sub>2</sub> values because in contrast to wood fibres and compost, it does not count as a renewable raw material.

The targeted use of volume-forming substrate raw materials in place of peat has a positive impact on the carbon footprint of this growing media. A goal was set of increasing the share of alternative substrate raw materials by 15% of the annual output volume by the year 2020. 📈

**KD**



# GREENHOUSE FARMING IN CANADA



*The reason for publishing a story on a foreign (and other hemisphere) country's greenhouse experience, is mainly for interest of our many readers in greenhouse farming here at the Southern tip of Africa.*



**Greenhouse employees tend to the vine plants at the Vine Fresh Acres site to maintain the overall health of the cucumbers in Ruthven, Ontario, Canada. Pic: Kati Panasiuk**

Canada's greenhouse vegetable growers can also grow produce throughout the winter, from British Columbia to Ontario to Newfoundland. The most popular vegetables across Canada are; tomatoes, cucumbers, lettuce, bell-peppers, green/yellow beans, eggplants and various herbs and microgreens. Of these commodities, tomatoes, cucumbers, and peppers are the main greenhouse vegetable crops grown commercially by larger scale farmers in Canada.

## Canadian Greenhouses in number

There are 934 greenhouse fruit and vegetable operations in Canada (February 2024).

Leamington is known and recognized as the greenhouse capital of Canada and has seen significant growth year over year in the greenhouse industry. Leamington is at the forefront of greenhouse and agricultural technology development in North America.

The benefits of growing plants and veggies in greenhouses are numerous. They keep plants from freezing in the fall (autumn), and warm over the winter due to improved insulation. They also take advantage of the "Greenhouse Effect" to allow sun to heat the air and ground in a greenhouse.

This greenhouse heating effect further reduces greenhouse air temperature swings, meaning plants

remain warmer at night and cooler during the day.

Pre-warming greenhouse air in spring can reduce greenhouse air temperature stress on young plants by protecting them from cool nights. It also speeds greenhouse warming in the spring since greenhouse sun light is already hitting greenhouse surfaces. This preheating is done with high quality (meaning more expensive) propane or natural gas-powered greenhouse heaters if an electrical power source isn't available for electric greenhouse heaters. However, using these kinds of greenhouse heating equipment typically require a bigger investment.

Greenhouse ground cover materials are also very important to prevent plant roots from heaving out of the soil due to alternate freezing and thawing cycles that take place. Ground cloth is important to keep down weeds also.

earlier than outdoor vegetables. The greenhouse season for vegetables is also much longer, often up to sixteen weeks of growing vegetables depending on the greenhouse type and location.

## A Canadian Greenhouse farmer

Mastronardi Produce Ltd., part of the family's 25-hectare crystal palace in this lush farm belt near Windsor, counts 500 varieties of tomato. Mastronardi is the biggest player in Canada's booming greenhouse vegetable industry and has several greenhouse operations elsewhere.

## Company origin

Paul Mastronardi is CEO and president of greenhouse giant Mastronardi Produce Ltd. headquartered in Kingsville; Ontario. Mastronardi calls himself "a modern farmer." Armando Mastronardi, Paul's great-grandfather, emigrated

▶ 16



**Paul Mastronardi is CEO and president of greenhouse giant Mastronardi Produce Ltd.**

◀ Greenhouses in Canada from page 15

in the 1940s from Italy; as a grower, he sensibly picked the country's southernmost spot. His son Umberto went to the Netherlands and brought Dutch greenhouse technology to Canada. "In the early eighties we got out of the dirt," Mastronardi said.

The Leamington area along the north shore of Lake Erie houses the greatest concentration of vegetable greenhouses in North America — an empire under glass.

**Increased value**

Shoppers routinely buy produce from California, Florida and Mexico, especially in winter. Yet veggies increasingly flow the other way, too. Ideal conditions — a temperate climate, innovative growers and proximity to the biggest markets in North America — have caused this industry to explode.

The value of Canada's greenhouse produce crop increased tremendously over past years. From Ontario alone, every day about 200 refrigerated transport trucks loaded with greenhouse tomatoes, peppers and cucumbers cross the border, headed to New York, Boston and as far away as Florida.

**Dark clouds**

The greenhouses, heated with natural gas, already struggle with increased fuel prices under Ontario's cap-and-trade carbon program. Electricity rate hikes have also taken



**Canada is situated in the North of the Americas. The most greenhouse operations are in the South in Ontario district.**

a toll. Now, the Ontario Greenhouse Vegetable Growers says Ontario's plan to raise the minimum wage and talks of greenhouses closing, or relocating is at hand.

A positive fact is Canadians consume more ketchup (tomato sauce) per

capita than anywhere else. And what does ketchup need most? A whole bunch of tomatoes. 🍅

**JS (information gathered through Canadian Greenhouse operators and newsletters)**

Remember to subscribe for your electronic copy of Undercover Farming! See P19

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# GROWING YOUR GREENHOUSE PLANTS IN REALISTIC TEMPERATURES

The main advantage of growing produce in a greenhouse is by and large the fact that the producer largely extends his seasons and control conditions for growing of crops. These may be specialist varieties of any kind, or general seedlings and vegetables.

The controlled environment can assist with growth for longer periods and getting crops started before the usual seasonal changes. In some colder regions of the world, due to very short growing seasons, and very short daylight hours, the only way to produce vegetables, is to grow it in a greenhouse.

## Insulation

For the producer to understand the insulation that polycarbonate provides in greenhouses, if the outdoor temperature is around zero degrees, the inside temperature in the greenhouse with doors and vents closed, should be in the region of 6 or 7°C. Although one is usually very concerned about keeping the warmth in during the colder months, the trick is to try maintaining the right temperature for your crops inside during both winter and summer.

In the summer months, the greenhouse must be kept cooler for crops to survive. Of course, a lot depends on what crops are being grown. Greenhouses can overheat easily especially in hot climates like we experience in South Africa. There are several ways to maintain the right temperature for your plants.

## Greenhouse site

It is recommended to choose a level, clean site, in a low traffic area with

easy access. Keep the following factors in mind:

- The change in the angle of the sun between summer and winter.
- Shade cast by the trees – in hot SA climates shading will help reduce the temperature (but during winter you need every bit of sun).
- Ease of access to water and electricity if required.

## Temperature / Light:

The more sun that is provided, the more heat the greenhouse will produce. The more heat produced the more ventilation is required. Place a thermometer near the middle of your greenhouse and monitor the temperature at different times. In hot climates, a simple option is to open the door/s in the morning and leave them open until late afternoon (this may lead to flying insects entering the production area).

Producers have reported excellent results in reducing the temperature in the greenhouse by painting the roof panels white. A recommendation is to use a paint product called 'Super-cooler U12' (an Israeli product), while some producers simply uses normal white PVA to be painted on the outside of the roof panels.

## Greenhouse Ventilation

Be sure to provide adequate window vents in your greenhouse. Cross ventilation will help prevent the greenhouse from overheating. Place the vents so that they will take advantage of prevailing winds. Most greenhouses should have vents that are equal in size to 15% of the floor space.



A tip from an experienced client: To ensure that your vents do not get ripped off in strong winds, attach a wire or heavy-duty string to both sides of each vent and the greenhouse frame. Allow enough play in the wire or string to allow the vent to open and close as needed. In strong winds, be sure to close your vents and latch them securely.

Automatic openers on the vents also assist correct temperature control and ventilation. Louver vents are included with each greenhouse as they increase cross ventilation.

An alternative to extra vents is having a thermostatically controlled exhaust fan system. Using very little electricity, the adjustable thermostat automatically provides ventilation for your greenhouse. The proper size fan will change the air intake in about 2 minutes.

To select the size for your greenhouse, determine the volume of the unit (Length x Width x Average Height) and multiply by 0.75 to obtain the ventilation rate in Cubic Meter per Minute (CFM). For the exhaust fan to operate effectively, fresh air intake shutters must be provided at the opposite end of the greenhouse. The shutters open with the flow of air drawn into the greenhouse by the fan

## ◀ Greenhouses plants from page17

or they can be opened and closed by a motor.

### Greenhouse Mistig / Humidity Control

Although shading and ventilation will keep your greenhouse from overheating, the actual cooling of a greenhouse comes from the evaporation or moisture inside the greenhouse.

The evaporating water soaks up heat like a sponge, when heat is used to change water from a liquid to a gas. Good air circulation from fans increases evaporation. A good misting system disperses water evenly around the greenhouse. The amount of moisture needed depends on the amount of ventilation, shading provided, your climate and the weather. The most accurate and most reliable is an automatic system of misting nozzles.

An easy and affordable system of cooling for the smaller producer, is to soak the floor with a sprinkler hose and open the roof vents and door, and the entire unit will cool down quickly. This must be done a number of times during the hottest times of the day. Only apply misting during the day to avoid excess humidity at night.

Use a 24-hour timer to shut off the system 2 hours before the sun goes down. If you live in a dry climate, in addition to your misting system an evaporative cooler works well.

Air is cooled 3 to 5°C degrees by water evaporation as it is



drawn through the cooler and into the greenhouse.

### Irrigation

Many owners choose the control of hand watering, however drip irrigation systems are effective and also prevent the leaves from getting too much water on them. Drip systems are gentle on seedlings, too. Over-watering in a climate controlled greenhouse environment has been the death of many a plant or seedling.

### Heating

Greenhouses can be heated with gas, coal burners or electricity, with or without thermostat controls. Your heating requirements will depend on your plants, climate, location of your site, and the construction of your greenhouse. The greenhouses with UV coated Polycarbonate glazing is better than most greenhouses in providing sun protection, light diffusion, and heat insulation.

A heating system must be able to maintain the desired temperature during the day and night. Your inside temperature should not go below 7°C at night.

For some plants even 7°C is too low. For larger greenhouses, gas heaters are recommended because it is less expensive. However, if your area suffers power outages, a gas heater might be more reliable. Any type of heating system you use should be properly vented to the outside of the greenhouse to avoid build up of any harmful gases.

To calculate how many BTUs your heater will need to provide and maintain the correct temperature for your greenhouse you will need to know:

- The area of your structure - the total square meters of the surface area (do not include the floor space).
- Minimum outside temperature-the lowest temperature for your area.
- Maximum Inside Temperature-the highest temperature you would need inside the greenhouse.
- Heat loss value: 0.7 for twin walled 4mm and 6mm thick polycarbonate.

### Formula:

Take your Area and multiply it times the (Max temp. minus the Minimum temp). Multiply heat loss equals the minimum amount of BTU output your heater you will need for your size greenhouse.

### Maintenance:

Your greenhouse will have maintenance requirements. Look out for bugs and fungus and keep the greenhouse clean. Use herbs as natural insecticides and only use natural / organic pesticides. Both the inside and outside of the greenhouses can be sprayed down with the hose on jet nozzle.

These important tips were compiled from various authorities on the subjects above. 🌹 JS

(Pictures: Bosman van Zaal)

# 10 THINGS YOU NEED TO KNOW ABOUT GREENHOUSE FARMING TECHNOLOGY

These 10 things you should get to know about greenhouse farming technology to increase your management know-how.

1. Greenhouses extend the growing season. In cold climates, greenhouses can be used to start growing crops earlier in the spring and continue growing crops later into the fall.
2. Greenhouses protect crops from adverse weather conditions. Greenhouses protect crops from wind, rain, hail, snow, and extreme temperatures.
3. It improve crop yields. Greenhouses control the environmental conditions, such as temperature, humidity, and light levels, to create an ideal environment for plant growth.
4. Grow crops that would not otherwise be possible. Greenhouses can be used to grow tropical fruits in cold climates.
5. Greenhouses produce high-quality crops. The controlled environment of a greenhouse helps to produce crops that are free of pests and diseases.
6. It reduce the use of pesticides and herbicides. The controlled environment of a greenhouse makes it easier to control pests and diseases without the use of chemicals.
7. Greenhouses conserve water. The controlled environment of a greenhouse helps to conserve water by reducing evaporation and runoff.
8. Greenhouses create jobs. The construction and operation of greenhouses require skilled labor.
9. Greenhouse farming improve food security. Greenhouses can be used to grow crops in areas that are prone to drought, flooding, or other natural disasters.
10. Greenhouses reduce our reliance on imported food. Greenhouses can be used to grow crops locally, which reduces our reliance on imported food. 🌱

**As appeared in Int. Greenhouse Guide, April 2024**



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