

# ucf Undercover farming

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# Celebrating 100 years of Rijk Zwaan

It is a history filled with the stories of our people who developed an initial idea, made a change, or planted the very first seed that led to the innovations of Rijk Zwaan today. The motto of Rijk Zwaan, 'moving forward,' is ingrained in the company's DNA. With an eye for innovation and progress, Rijk Zwaan continues to pioneer and breaking new grounds.

We are very grateful for the contributions of employees, customers, and partners to its success and looks forward to many fruitful years of collaboration and growth. This is the first day of our new centenary!

Join us in celebrating our centenary!  
#rijkszwaan100years | [www.rijkszwaan.com/100years](http://www.rijkszwaan.com/100years)

**100 years of people, pioneering and moving forward**



**RIJK ZWAAN**  
100 YEARS

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SCRIPTURE



Fill your minds with those things that are good and deserve praise; things that are true, noble, right, pure, lovely, and honourable. Put into practice what you learned and received from me, both from my words and from my actions. And the God who gives us peace will be with you. – Philippians 4:8-9

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FRONT PAGE:  
The Doufu RZ F1 Tomato Variety

INSIDE ...



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Climate plays a vital role in greenhouse farming. This statement could be understood for the good or wrong. On the upside, as readers will notice in this edition, with good management principles, proper forward financial planning to employ available technologies in the processes, success can be attained in greenhouse farming. On the downside, if the aforesaid principles are not adhered to and the greenhouse operator still thinks the way an open land farmer does, failure is imminent. Over and above that; there is no way, nowhere in the world that even scientists can predict accurately what weather circumstances will be experienced once plants are about to produce. Producers of foodstuffs, over many ages have learned to contend with that, otherwise should have chosen a 'more secure' profession. We are touching on several important aspects regarding diseases, humidity, grow media and starting with aquaponics in this issue and hopefully it will put the readers' 'thinking cap on', in a manner of speaking. Our undercover producers still have, like their neighbours, to do with poor road systems, ill managed market systems and export adversities while the inhabitants struggle to survive with much inflated food and other imported (note; not 'important') commodity prices. Somewhere along our happy route in South Africa when we looked after ourselves as far as locally produced food, clothing and many other commodities were concerned, something went terribly wrong and we have poverty and a jobless society all around us. Apologies for the negative note, but reality is reality. Fortunately, as South Africans, we are globally known as a nation that survives fierce onslaughts. Let's carry on farming – the noblest profession I know! Ed.

# THE DOUFU RZ F1 TOMATO VARIETY: A Grower's Perspective



The world of tomato cultivation is constantly evolving, with new varieties offering growers the potential for higher yields, better quality, and improved resistance to diseases. One such variety making waves in the horticultural industry is the Doufu RZ F1, developed by Rijk Zwaan. This intermediate, beef-type tomato variety has been gaining popularity due to its impressive performance across various growing conditions.

## Overview of Doufu RZ F1

The Doufu RZ F1 is a versatile tomato variety that can be cultivated in single or multi-span plastic greenhouses, making it suitable for a wide range of climates and regions. Its adaptability, combined with the superior fruit quality, makes it an

excellent choice for growers looking to maximize their production.

The variety is characterized by its balanced, open plant structure that maintains good vigor throughout the growing season. This vigor is crucial, as it ensures the plant can support a consistent fruit set and development, even under challenging conditions. The average fruit weight ranges from 160g to 240g, making it ideal for markets demanding medium to large-sized tomatoes.

## Fruit Quality and Market Appeal

One of the standout features of the Doufu RZ F1 is its exceptional fruit quality. The fruits have thick walls, which not only contribute to a more robust and resilient product but also improve shelf life. This is a significant advantage for growers and distributors, as it reduces losses during transportation and storage.

The fruit colors easily to a glossy red, free of green shoulders, a common issue that can affect the aesthetic and market value of tomatoes.

This uniform coloration is highly desirable in the market, as it signals ripeness and quality to consumers.

Additionally, the fruit has a good Brix value, indicating a favorable balance between sweetness and acidity, which is key to consumer satisfaction.

## Adaptability to Different Growing Conditions

One of the most appealing aspects of the Doufu RZ F1 is its adaptability. This variety thrives in various greenhouse

environments, whether single or multi-span structures. Its adaptability allows growers in different regions, from spring to autumn, to cultivate it successfully, providing a continuous supply of high-quality tomatoes throughout the year.

This adaptability is not just limited to different climates but also to various levels of expertise among growers. Whether you're a seasoned professional or a newcomer to tomato cultivation, the Doufu RZ F1 offers a manageable and rewarding growing experience. Its balanced growth habit and vigor make it easier to manage, reducing the need for intensive pruning or training, which can be time-consuming and labor-intensive.

## Disease Resistance

In modern horticulture, disease resistance is a crucial factor when selecting tomato varieties. The Doufu RZ F1 boasts an impressive array of resistances that make it a reliable choice for growers. It has high resistance (HR) to Tomato Mosaic Virus (ToMV), Leaf Mold (Ff), Fusarium Wilt (Fol), Stemphylium (Sbl), and Verticillium Wilt (Va/Vd). These diseases can be devastating to tomato crops, leading to significant losses if not managed properly. The high resistance of Doufu RZ F1 to these pathogens means growers can have greater confidence in their crop's health and yield potential.

In addition to these high resistances, Doufu RZ F1 also exhibits intermediate resistance (IR) to root-knot nematodes (Ma/Mi/Mj), which are another common issue in tomato cultivation. These microscopic pests can cause severe damage to tomato roots, leading to reduced water and nutrient uptake and ultimately impacting plant health and fruit production. The intermediate resistance offered by Doufu RZ F1 helps to mitigate these risks, further enhancing its suitability for diverse growing conditions.



# Doufu RZ F1

## Intermediate Tomato

Balanced open plant maintaining good vigour. Exceptional fruit quality with thick fruit walls.

HR: ToMV:0-2/Ff:A-E/Fol:0,1/Sbl/V:0/Vd:0 IR: M/Mi/Mj

For more information contact: 061 120 3082

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



◀ The Doufu RZ F1 Tomato from page 6

## Yield Potential and Economic Viability

For growers, yield potential and economic viability are always at the forefront of decision-making. The Doufu RZ F1 does not disappoint in this regard. Its combination of good fruit set, consistent size, and high marketable yield makes it a profitable choice. The balanced plant vigor ensures that the plants remain productive over an extended period, providing a steady harvest that can meet market demands.

The thick fruit walls and good shelf life translate into fewer post-harvest losses, which is another crucial aspect of economic viability. Reduced losses mean that a higher percentage of the harvested fruit can be sold, increasing overall profitability. Moreover, the excellent fruit quality ensures that the produce commands a premium price in the market, further enhancing the grower's return on investment.

## Cultivation Best Practices for Doufu RZ F1

To maximize the potential of the Doufu RZ F1 variety, it's important to follow best practices in cultivation. Here are some key recommendations:

**Greenhouse Management:** Given that Doufu RZ F1 is suitable for single or multi-span plastic greenhouses, ensure that the greenhouse environment is well-managed. This includes maintaining optimal temperature, humidity, and ventilation to prevent disease outbreaks and promote healthy plant growth.

**Irrigation:** Consistent and appropriate irrigation is crucial for maintaining plant vigor and fruit quality. Drip irrigation is recommended, as it delivers water directly to the root zone, minimizing water waste and reducing the risk of foliar diseases.

**Fertilization:** The balanced growth habit of Doufu RZ F1 requires a well-planned fertilization strategy. Ensure that the plants receive adequate nutrients, particularly nitrogen, phosphorus, and potassium, to support strong vegetative

and generative growth and fruit development. Regular soil testing can help fine-tune the fertilization regime.

## Pest and Disease

**Management:** Although Doufu RZ F1 has strong resistance to several diseases, it's still important to implement integrated pest management (IPM) practices. Regular monitoring for pests and diseases, combined with the use of biological controls and targeted chemical interventions when necessary, will help maintain plant health and productivity.

**Pruning and Training:** While the open plant structure of Doufu RZ F1 reduces the need for intensive pruning, some maintenance is still required. Regularly remove any diseased or damaged foliage, and ensure that the plants are adequately supported to prevent fruit from touching the ground, which can lead to rot.

## Case Studies and Grower Testimonials

Several growers have already experienced the benefits of cultivating the Doufu RZ F1 variety. For instance, a grower in Southern Spain, who traditionally struggled with Fusarium Wilt (Doufu has resistance against two of the three strains), reported significantly reduced disease pressure after switching to Doufu RZ F1. The grower also noted an increase in marketable yield and a higher average fruit weight compared to the previous variety.

Another grower in the Netherlands, operating in a multi-span greenhouse, highlighted the uniform fruit size and excellent shelf life of Doufu RZ F1 as key advantages. The grower was able to extend the marketing period of the tomatoes, reducing the need for frequent harvesting and allowing for better labor management.

## Market Opportunities and Future Prospects

As consumer demand for high-quality,



flavorful tomatoes continues to grow, varieties like Doufu RZ F1 are well-positioned to meet this demand. The combination of exceptional fruit quality, adaptability, and disease resistance makes it a strong contender in both domestic and international markets.

Looking ahead, the future prospects for Doufu RZ F1 are bright. As more growers adopt this variety and share their success stories, it's likely that demand for seeds will increase. This could lead to further innovations in breeding, potentially enhancing the variety's characteristics even more.

## Conclusion

The Doufu RZ F1 variety from Rijk Zwaan offers a compelling package for tomato growers. Its adaptability, combined with exceptional fruit quality and strong disease resistance, makes it an excellent choice for a wide range of growing conditions. Whether you're looking to improve yield, reduce losses, or enter new markets, Doufu RZ F1 provides the tools you need to succeed. As the market for high-quality tomatoes continues to expand, this variety stands out as a reliable and profitable option for both seasoned growers and newcomers alike.

**For more information contact:**  
**061 120 3082** 📞



# GOOD 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 actually 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. We just need to have the right tools.

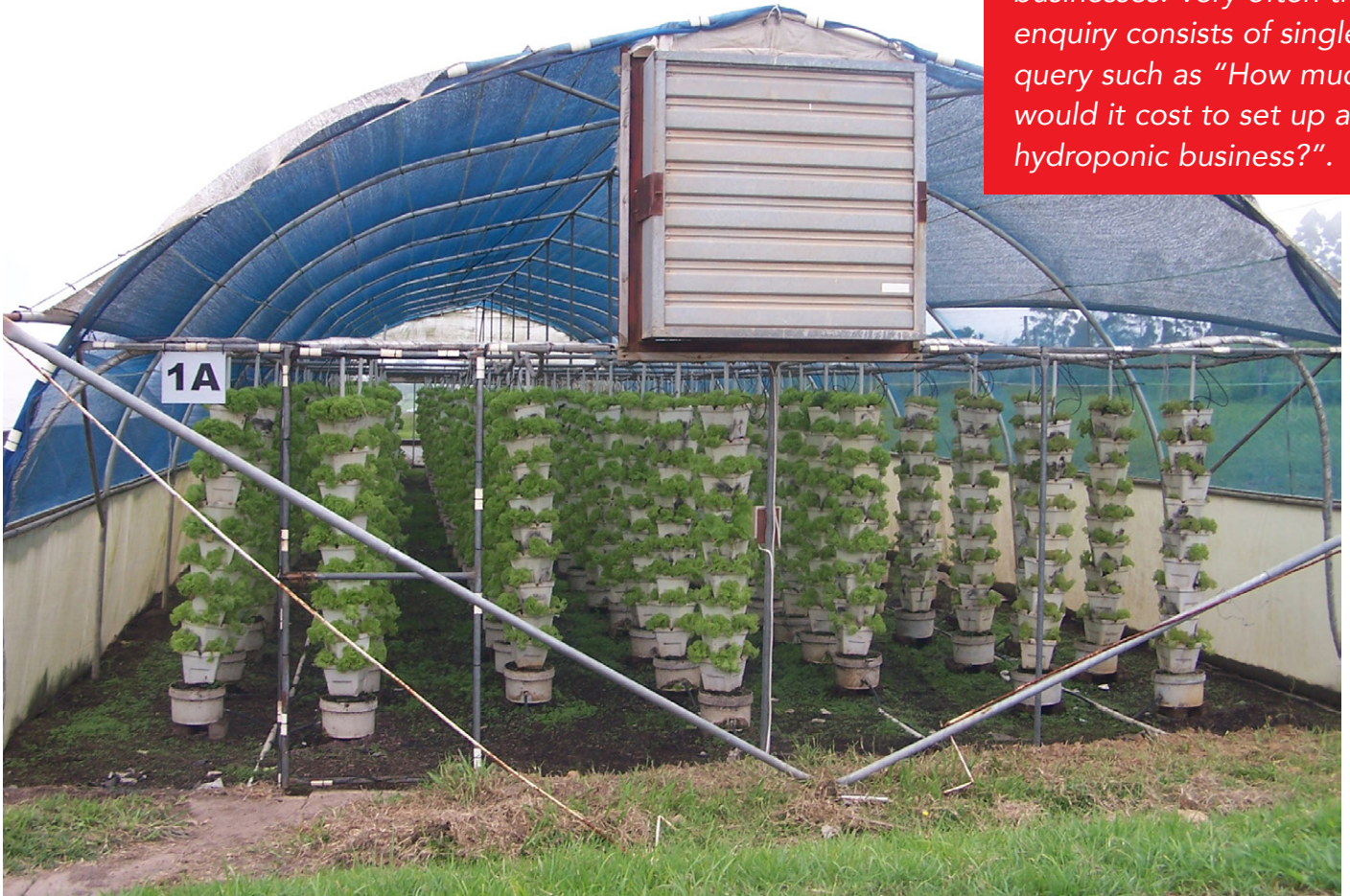
Using the tools mentioned above, you can make important decisions as to when and how much irrigation is required on a day-to-day basis, as well as refining your general irrigation strategy for the steering of your plants. 🌱

**By: Martin von Holdt; Greenhouse Management Solutions.**

# HOW TO MAKE MONEY WITH HYDROPONICS

BY JOHN SANDISON\*

*We receive many enquiries from people wishing to start up hydroponic businesses. Very often the enquiry consists of single query such as "How much would it cost to set up a hydroponic business?"*



Asking such a question is a bit like asking "How long is a piece of string?" or "How much is a motor car?"

Naturally, many details need to be established before we are able to begin to estimate how much such an investment would be, and the following points must first be established before we are able to proceed to answer such a query:

- Where would the hydroponic farm be established? Give geographical area.
- What are the climatic conditions in that area? Give height above sea level, distance from the nearest coast, average monthly rainfall, average maximum and minimum temperatures.
- Size of the piece of land envisaged for the project. What direction does

the land slope towards? Approximate % slope.

- How many m2 will be given over to hydroponics?
- What vegetables/fruit will be grown? Please specify the % of the growing area to be occupied by each crop.
- Please specify what is the source of water i.e. stream, dam, borehole, municipal water, roof-top harvest.

There are specific reasons why we need this information; for example, different crops are grown using different systems so until we know what it is you have in mind to grow we are unable to cost out a system to suit.

If you want to grow fresh produce hydroponically for home consumption it's as important that you do it as successfully as you would if you were

growing commercially for profit, and to do this you'll need to be able to answer all the questions above and more. In fact the more you know about the pitfalls the better you'll be able to avoid paying school fees through making mistakes of which you were unaware because of a lack of learning.

Now an on-line course can never provide you with the depth of learning that you'll require if you are going to invest your hard-earned money in a project that may or may not return you a profit depending upon your ability to make the correct decisions.

Here are some examples:

- Did you know that you cannot grow strawberries under plastic? The plastic keeps the heat in, and the humidity generated by the environment and the plants



themselves surges too high for the plants to pollinate, so the yields are too low to generate a profit.

- Did you know that South African strawberry cultivars produce berries that have white shoulders and are sour? The sugar content is often lower than a critical 8%. Cultivars originally from California or Florida are 'day-neutral' and are much sweeter, redder and have no marketing resistance like South African ones.
- Generally South Africa has a warm climate; did you know that lettuce grows best in a cold climate where the temperature does not exceed 24C? There are also certain essential factors that must be adhered to if one is to grow fresh produce in a hot and/or humid climate – factors which you are unlikely to be taught on Face Book.
- Did you know that if you plant a seedling in a growing medium and the roots bend as they go in to form a 'J' then the plant will die?
- Did you know that you can grow vertically in hydroponics and fit 6 times the number of plants in the same area when compared to growing horizontally on the ground? This can save you a fortune in greenhouse space and land but you must do it the right way so that the lower plants don't suffer from a lack of oxygen and nutrient.
- Most importantly, do you know how to calculate how large an investment you need to make to guarantee that your project will make a profit? A single tunnel or greenhouse can never produce turnover high enough to cover the expenses of maintaining it. You need to be able to calculate where your breakeven point lies so that you can be guaranteed to make a profit. Unless you know this you are doomed to failure.

The list goes on and on and the only way to ensure that you have all the bases covered is to go on a professional course in hydroponics. To find out more go to [www.hydroponicssouthafrica.co.za](http://www.hydroponicssouthafrica.co.za), click on 'learn'. There are many good books available on the subject.

Tomatoes grow excellently in the Verti-Gro system.

**John Sandison has 3 certificates in Advanced Hydroponics and owner-managed his own hydroponic farm for ten years. He has 24 years' experience with hydroponics and is the sole South African licensee to mould and market Verti-Gro in Southern Africa. He has written a book titled "Guide to Profitable Hydroponics" available on Amazon.**



Four plants are placed in the top pot, and they grow outwards and downwards. As the top pot in a 9-pot system is over 2m high there is plenty of room for the plants to grow. Pots below the top two can be dispensed with.

Determinate varieties should be chosen for this procedure as indeterminate ones would grow too long and end up on the floor of the tunnel.

7 000 lettuces can be grown in an 8x 30m tunnel and 9 000 in a 10 x 30m one x 10 crops p.a. = 70 000 and 90 000 heads respectively p.a.

The columns are scientifically spaced so that nutrient water and light distribution are evenly spread to each plant, resulting in even growth top to bottom. 🌈

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

## © Verti-Gro

Fits six times the number of plants in the equivalent square area

### BENEFITS AND ADVANTAGES

- An 8 x 10m tunnel can accommodate 7000 plants and a 10 x 30m tunnel 9000 plants
- Maximum utilisation of space.
- Optimum use of light and water distribution
- Lightweight, re-usable pots.
- Cost-effective.
- Easy picking at accessible levels with less damage to the plant or the fruit.
- Cool roots.
- Excellent drainage of nutrient/water.
- Easy to transport
- Easy to install
- Versatile



For more information  
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076 627 7680



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# UNLOCKING THE AGRICULTURAL REVOLUTION: TTI - MASTERS OF IRRIGATION



## TTI: Pioneering Precision Agriculture

At the heart of TTI's mission lies a relentless pursuit of innovation and a dedication to revolutionizing the way we approach agriculture. With a keen understanding of the evolving needs of farmers, TTI has consistently pushed the boundaries of what's possible, introducing groundbreaking technologies and solutions that optimize efficiency, sustainability, and productivity.

## Redefining Soil Management: Precision at Its Core

In the realm of soil management, precision is paramount, and TTI leads the charge with its comprehensive suite of precision soil care solutions. From



to optimize water usage and minimize waste.



By maximizing efficiency, TTI empowers farmers to achieve higher crop yields while conserving precious resources. With SABI approved certification, Francois Fourie and his business partner, Gerrie Gerritsen have a hands on approach to projects and leads their team of expert craftsmen ensuring their clients' peace of mind.

## Precision Agriculture: Shaping the Future of Farming

In the era of precision agriculture, data is king, and TTI harnesses the power of data analytics to drive informed decision-making.

Through innovative precision agriculture solutions, TTI provides farmers with unprecedented insights into soil health, moisture levels, and crop performance, empowering them to optimize inputs and maximize returns.

In the dynamic realm of modern agriculture, the name Turf Technology & Irrigation (TTI) resonates as a beacon of innovation and excellence. With a steadfast commitment to pushing the boundaries of agricultural technology, TTI has emerged as a driving force behind the transformation of farming practices worldwide. Join us as we embark on an in-depth exploration of TTI's journey, uncovering the secrets behind its unparalleled success and the cutting-edge solutions it offers to revolutionize the agricultural landscape.

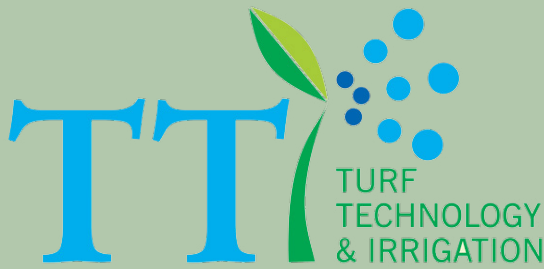
state-of-the-art mowing equipment to advanced fertilization systems, TTI's offerings are designed to optimize every aspect of soil maintenance, ensuring pristine farming landscapes that stand the test of time.

## Maximizing Efficiency with Smart Irrigation Solutions

Water scarcity poses a significant challenge for farmers worldwide, making efficient irrigation practices more critical than ever. TTI addresses this challenge head-on with its cutting-edge smart irrigation solutions, leveraging the power of data analytics and automation

▶ 12





# Precision irrigation Specialist

Where precision leverage profit



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- Precision Irrigation and Fertilization
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+27 83 626 6573  
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www.tt-i.co.za

◀ TTI from page 10



**Sustainability at the Core: Nurturing the Land for Future Generations**

In today's environmentally conscious world, sustainability is not just an option; it's a necessity. TTI embraces this ethos wholeheartedly, integrating sustainable practices into every aspect of its operations.

From eco-friendly equipment designs to water-saving irrigation technologies, TTI is committed to helping farmers operate in harmony with the planet, ensuring a brighter future for generations to come.

**Empowering Farmers with Knowledge and Support**

At TTI, customer success is more than just a priority; it's a guiding principle. Recognizing that education and support are essential for farmers to unlock the full potential of their investments, TTI offers comprehensive training programs, expert technical support, and ongoing consultancy services. By empowering farmers with knowledge and resources, TTI ensures that they stay ahead of the curve and achieve their goals.

**Unrivalled Quality and Reliability: The TTI Difference**

In an industry where reliability is paramount, TTI sets the standard for quality and performance. With products engineered to withstand the rigors of agricultural life, TTI ensures seamless operation and minimal downtime for

farmers. From robust construction to rigorous quality control measures, every aspect of TTI's offerings reflects a commitment to excellence and reliability.

**A Global Network of Excellence: Serving Farmers Worldwide**

With a presence in markets around the globe, TTI boasts a vast network of partners and distributors, ensuring that farmers everywhere have access to its world-class solutions.

This global reach not only underscores the quality of TTI's products but also reflects its unwavering commitment to serving the needs of farmers worldwide.

**Shaping the Future of Agriculture with TTI**

As we stand on the precipice of a new era in agriculture, one thing is clear: the future belongs to those who embrace innovation, sustainability, and excellence. Turf Technology & Irrigation leads the charge, offering a comprehensive suite of solutions that empower farmers to thrive in an ever-changing world. From precision soil management to smart irrigation solutions, TTI continues to

shape the future of farming, one field at a time.

For farmers seeking to unlock the full potential of their land and achieve optimal yields with minimal environmental impact, TTI remains the partner of choice. 🌱

**For more information:**  
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**Francois Fourie +27 83 626 6573**

**Francois Fourie and his business partner, Gerrie Gerritsen**



# 100 YEARS of people, pioneering and 'moving forward'

Rijk Zwaan, an international fruit and vegetable breeding company, is celebrating its first centenary. Since its foundation in 1924, Rijk Zwaan has grown into a global player active in more than 100 countries. The centenary celebrations kicked off on 1 July, the exact date that the company was originally founded. During the festivities, the King's Commissioner made an impressive announcement: Rijk Zwaan has been granted the Dutch honorary royal title 'Koninklijk'.

"After 100 years of entrepreneurship and innovation, one can say that Rijk Zwaan is of great importance for the future of humanity", says Jaap Smit, the King's Commissioner, during the festive kick-off of the breeding company's Centenary Celebration.

Ben Tax, one of Rijk Zwaan's board members, commented: "We are delighted to receive this title. It is a symbol of societal appreciation and underlines the longevity of our company. This is the ultimate recognition of the efforts of everyone involved. Because, above all, people are the heart and soul of Rijk Zwaan."

## History shaped by growth

The company's rich history began when the founder, Mr Rijk Zwaan himself, opened a seed shop in Rotterdam in 1924. His focus on quality and innovation proved to be a recipe for

success. For the first four decades, the emphasis was on the horticultural market in the Netherlands, but exports to neighbouring countries gradually increased. In 1964, the first subsidiary was opened in Germany. This was followed by Rijk Zwaan France in 1982. From the 1990s onwards, the company expanded faster than anyone could have imagined. Today, Rijk Zwaan employs 4,000 people. The company is represented in over 100 countries through more than 30 subsidiaries in all four corners of the globe. The head office is in the Netherlands.

## Positive social impact

Due to the growing world population, especially in Africa and Asia, the demand for fruits and vegetables will continue to rise. Rijk Zwaan is staying ahead of this trend by developing fruit and vegetable varieties that are adapted to local climates, cultivation methods and consumer preferences.

In Tanzania, for example, the company has been breeding specifically for the African market for 15 years, and is now also increasingly focusing on the southeast Asian market from its facility in Vietnam. Board member Marco van Leeuwen explains: "By breeding improved local varieties, we aim to offer growers opportunities to obtain higher yields. Then, to boost their sales, we connect them with processing companies and retailers. Ultimately, this



**RIJK ZWAAN**  
100 YEARS

gives more people access to fresh and healthy fruits and vegetables. Seeds are not only the starting point for successful crops, but also for broader opportunities and possibilities."

## Continuous innovation

Every day, millions of people eat fruits and vegetables grown from Rijk Zwaan's seeds. That responsibility inspires the company to focus on the future and continue innovating for its customers and value chain partners. "Recently, we've expanded into breeding tropical crops. At our breeding facility in Brazil, we select fruit and vegetable varieties that thrive in a hot and humid climate with the occasional heavy rain shower," says board member Kees Reinink.

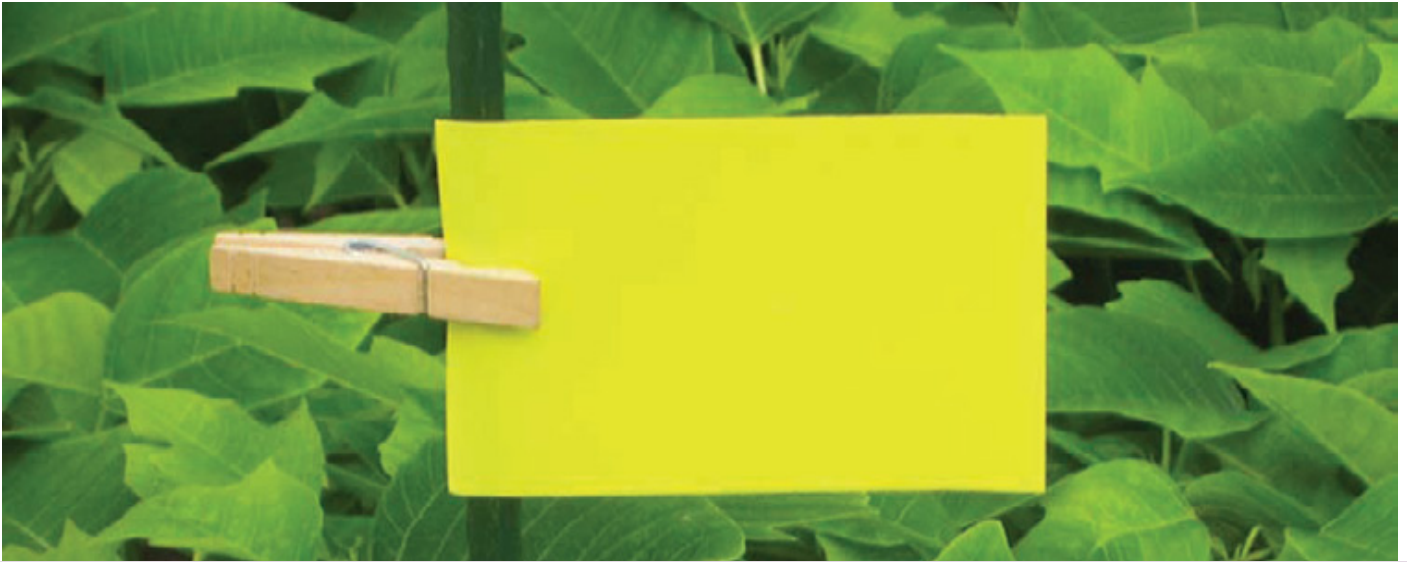
Additionally, earlier this year, Rijk Zwaan opened a new breeding facility in the Netherlands for berries: strawberries, blackberries and raspberries. Kees Reinink: "That's another example of how we continue pioneering and breaking new ground."

## The first day of the next century

The motto of 'moving forward' is firmly embedded in Rijk Zwaan's DNA. With its focus on innovation and progress, the company will continue to pursue a pioneering approach. The board members are grateful to all employees, customers and value chain partners for their contribution to the success so far, and are looking forward to many more fruitful years of collaboration and growth in the coming century. 🌅

**For more information contact:**  
**061 120 3082**





# CONFLICTING PEST CONTROL COULD INCREASE PEST POPULATIONS

**P**roducers applying the wrong combination, environmentally and health-friendly pest control strategies might increase crop pest populations. An earlier European research project, led by University of Amsterdam researcher Merijn Kant, will put this counter-intuitive idea to the test.

Pests on agricultural crops can be a serious nuisance for farmers who do their best to keep the unwanted bugs in check. In order to limit impacts on the environment and human health, crop protection in the European Union relies increasingly on the use of biological control, pest-resistant plants, and 'green' pesticides containing natural compounds instead of synthetic compounds.

As each of these methods is insufficient effective on their own, there is a tendency to combine the strategies. This concept of integrated environmentally-friendly pest control sets the European agenda for agriculture.

## Wrong combinations

However, using the wrong combination of strategies may actually lead to an increase in crop pest populations. 'Predator-prey models predict that

resistance breeding and pesticides – with synthetic or natural – may hamper biological control to an extent that the level of overall crop protection will often decrease rather than increase', says Dr. Merijn Kant of the Institute for Biodiversity and Ecosystems Dynamics.

Giving plants a helping hand by tweaking their genes through targeted breeding to create resistant plants might hinder the actions of biological control agents just as they hinder unwanted pests. One instance in which this can happen is when the plant is resistant because it is less palatable for insects. This will affect not only the harmful insects but also the beneficial ones since their prey will be of poorer quality.

Mathematical models predict that under these conditions harmful insects may actually escape predation better than if they feed on plants void of resistance. They can thus reach higher densities and inflict more damage to the crop. In this case, plants without defences may be defended better with biological control.

## Urgent risk

The EU has recently banned various popular pesticides, creating an open niche for breeders to invest in new

resistances for their crops. The time is now for further research on conflicting environmentally-friendly pest control strategies.

'The counter-intuitive concept should be tested because the results can profoundly alter the rationale behind the design of integrated pest management strategies, says Dr Merijn Kant. 'If we ignore this, we expect an enormous decrease in efficiency of environmentally friendly pest control, one that resistance breeding and 'green' pesticides cannot compensate for.'

## Defenseless defenses

As the coordinator of the new European project Kant cooperates with scientists from three different research institutions in the Netherlands, Belgium and Spain. Together they will assess to which extent prey densities in a predator-prey system, i.e. a bio-control agent and its target pest, are influenced by chemical plant resistance traits and natural pesticides.

The three-year project, entitled Defdef (short for 'Defenseless defenses'), had a total budget of €590,000 and has been granted through the Coordinated Integrated Pest Management (C-IPM) second call. 📍 **Source: University of Amsterdam**

# TUTA ABSOLUTA - A SERIOUS TOMATO PEST



*Tuta absoluta* moth, approximately 6 mm in length.

The tomato leafminer (*Tuta absoluta*) is a serious pest on tomatoes and is also reported to feed on other important crops in the Solanaceae family. The pest, originally from South America, was first detected in Europe in 2006, but since then it has spread to several African countries, including South Africa.

Twenty-one plant species are reported to be hosts of *Tuta absoluta*. Apart from its primary host plant, i.e. tomato, some of the important host plants include crops like potato, sweet pepper, eggplant and Cape gooseberry, as well as several weed species. It is currently only on tomato that serious damage and yield losses are reported - the first significant reports received in South Africa emanated from the Komatipoort region of Mpumalanga and organic tomato farmers in the Bapsfontein area. Serious damage or yield losses on other crops have not been received yet.

Approximately one generation per moth is completed during the warmer times of the year. The number of eggs that can be laid by one female is approximately 260; the majority of eggs are laid within the first five days after mating. Eggs are laid singly, mainly on leaves, but also on all above-ground parts of host plants.

First instar larvae mine into plant parts, and as the larvae grow, irregular blotch leaf mines are created when feeding on leaves. The tomato leafminer needs approximately two weeks to complete the larval stage, after which the fully grown larva (up to 8 mm in length) spins a silken cocoon in which it pupates. The pupation location is mostly on the soil surface, but may be anywhere on the plant, i.e. in leaf miners or in leaf folds. Commercial tomato farmers



D Visser ARC-VOP Roodeplaat *Tuta absoluta* leaf mine

mostly utilize insecticides to control *Tuta absoluta*. The Department of Agriculture allowed emergency registrations for 11 insecticides recently; farmers need to consult the Department's webpage for a full list and guidelines for control. Other control strategies against the tomato leafminer include the use of synthetic pheromones, the removal of infested material and volunteer plants, and the reliance on natural enemies.

Pheromone lures for the tomato leafminer are available from suppliers in South Africa. Currently, these lures are used in traps to monitor for the presence, and pest pressure, of male moths of the tomato leafminer. Several natural enemies, including parasitoids and predators, are known to suppress tomato leafminer numbers in crops. All of these control strategies may be incorporated in an integrated control program when the need arises in the future for tomato leafminer control.

It is expected that the severity of *Tuta absoluta* may increase on crops under protection, e.g. in glasshouses and greenhouses. The protected environment is not only conducive to plants, but also for pests like *Tuta absoluta*. However, the contained environment enables the farmer to

monitor the pest more accurately and pesticides may be more stable and therefore more effective when applied according to label instructions.

*Tuta absoluta* has now been present in the country over a number of years. Reports of moth catches with pheromone traps are received from across South Africa, and more reports of severe infestations are expected, especially on tomatoes during the next summer months. Tomato and potato farmers should be vigilant and ready to implement control measures when the pest arrives on their farms. 🌹

**By: Diedrich Visser, Agricultural Research Council-Vegetable and Ornamental Plants (ARC-VOP)**



# OUTCRY FOR ASSISTANCE TO flood-ravaged Citrusdal



**Although mandarin orange fruit orchards were also flooded, in most cases harvesting continued.**

**U**rgent funding is required to help the farmers of Citrusdal's agricultural community out of flood distress. The Citrus Growers' Association of Southern Africa (CGA) has written to the Western Cape Minister of Agriculture, Dr Ivan Meyer, to request support for the farming communities in Citrusdal.

Of late, the area has suffered from flood damage for the second time in the past two years. It is also marked the the third time in two years that the town had been completely cut off from the rest of the province after the the Olifants River flooded.

The CGA said the community was facing a "very difficult time". There have already been reports of essential goods shortages.

Gerrit van der Merwe, chairperson of the CGA and a citrus grower in the area, said "Concerning costs to the agricultural community specifically, early estimates suggest that the floods were more serious than those of 2023.

Last year damage of more than R430m was experienced by citrus growers in the

valley alone."The CGA said it welcomed the fact that the provincial government had approached the National Disaster Management Centre and that a state of disaster had been declared.

"The organisation asked minister Meyer and his department for assistance in securing swift and effective access to funding and support," the association stated. "The CGA also requested that the citrus growers and farm workers of Citrusdal, who have been the hardest hit, be prioritised."

Van der Merwe said the citrus industry was the very heart of the community and generated opportunities for employment and economic betterment throughout the area.

"In the meantime, a private bridge on Mouton Citrus farms offers an option for reconnecting the town, but issues touching on liability, traffic management and possible infrastructure deterioration need to be addressed before this option can be actioned," he noted. The CGA said access via roads should be speedily resolved.

"Not just for everybody in the town, but

also because it is currently the height of the export season" it outlined. "The floods have unfortunately coincided with the mid-point of the season, as massive volumes of especially oranges need to be moved to the Port of Cape Town."

The citrus industry humbled by the fact that it "contributed substantially" to the Western Cape economy, the CGA confirmed. "Every year we export more than 20m 15kg cartons of citrus from Western Cape orchards to overseas markets," it said.

"Since severe weather is becoming a regular occurrence, more must be done to ensure that Citrusdal's infrastructure and emergency management can handle high water levels.

"During the past year we also welcomed the provincial department's extension of the current river protection works programme to flood-affected river systems," CGA added. "Everything possible should be done to mitigate the impact of future floods." **Source: CGA**



A pair of red over-ear headphones is shown from a top-down perspective. The ear cups are filled with fresh green lettuce leaves. The headband is black and red. The background is white with a blue triangle in the top right corner.

Hou jou vinger op  
die pols van landbou





How clean is the water entering the reservoir from the Municipal or District dam or river nearby?

Alkalinity and pH are two important factors in determining the suitability of water for irrigating plants. pH is a measure of the concentration of hydrogen ions (H+) in water or other liquids. In South Africa, not only homeowners are concerned over water quality, but also fresh food customers – but ultimately; fresh food producers – especially in greenhouses.

In general, water for irrigation should have a pH between 5.0 and 7.0. Water with pH below 7.0 is termed “acidic” and water with pH above 7.0 is termed “basic”; pH 7.0 is “neutral”.

Sometimes the term “alkaline” is used instead of “basic” and often “alkaline” is confused with “alkalinity”. Alkalinity is a measure of the water’s ability to neutralize acidity.

An alkalinity test measures the level of bicarbonates, carbonates, and hydroxides in water and test results are generally expressed as “ppm of calcium carbonate (CaCO<sub>3</sub>)”. The desirable range for irrigation water is 0 to 100 ppm calcium carbonate. Levels between 30 and 60 ppm are considered optimum for most plants.

Irrigation water tests should always include both pH and alkalinity tests. A pH test by itself is not an indication of alkalinity. Water with high alkalinity (i.e., high levels of bicarbonates or carbonates) always has a pH value  $\geq 7$  or above, but water with high pH doesn’t always have high alkalinity. This is important because high alkalinity exerts the most significant effects on growing medium fertility and plant nutrition.

#### High pH and High Alkalinity Effects on Plant Nutrition

Potential adverse effects; In most cases irrigating with water having a “high pH” (7)

# WATER QUALITY: pH and Alkalinity – How this affects the Greenhouse Grower

causes no problems as long as the alkalinity is low. This water will probably have little effect on growing medium pH because it has little ability to neutralize acidity. This situation is typical for many growers using municipal water, including water originating from reservoirs where poor management is prevalent.

Of greater concern is the case where water having both high pH and high alkalinity is used for irrigation. One result is that the pH of the growing medium may increase significantly with time. This increase may be so large that normal lime rates must be reduced by as much as 50%. In effect the water acts as a dilute solution of limestone!

The problem is most serious when plants are grown in small containers because small volumes of soil are poorly buffered to pH change. Therefore, the combination of high pH and high alkalinity is of particular concern in plug seedling trays. Trace element deficiencies and imbalances of calcium (Ca) and magnesium (Mg) can result from irrigating with high alkalinity water.

#### Potential beneficial effects

For some greenhouse operators, water with moderate levels of alkalinity (30-60 ppm) can be an important source of Ca and Mg. Most water soluble fertilizers do not supply Ca and Mg. Also, the Ca and Mg from limestone may be inadequate for some plants. Moderately alkaline water could be beneficial as a source of extra Ca and Mg for crops prone to Ca and Mg deficiencies (e.g., poinsettia).

#### Other Effects of High pH and High Alkalinity

In addition to nutritional disorders of plants, water with high alkalinity can cause other problems. Bicarbonates and carbonates can clog the nozzles of pesticide sprayers and drip tube irrigation systems with obvious effects. The activity of some pesticides, floral preservatives, and growth regulators is markedly reduced by high alkalinity.

When some pesticides are mixed with water they must acidify the solution to be completely effective. Additional acidifier may be needed to neutralize all of the alkalinity. To determine if a chemical is affected by high alkalinity, carefully review the product’s label.

Unfortunately this potentially important information is not always printed on the label, so considerable extra effort may be necessary to find the information. A call to the manufacturer will probably be needed for most chemicals. 📌

By: N Mattson



Testing the pH in a greenhouse.

# MANAGING A PROFITABLE AQUAPONICS SYSTEM

*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. Leslie Ter Morshuizen, formerly of Aquaculture Innovations, explains in short how the farmer can become more profitable.*

**"T**he relevance of this to us in Aquaponics is that we need to keep our 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.

"The rafts and beds need to be kept full of crops at all time, 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. We should also manage theft closely as this is an economic killer.

"In the market place 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 our crops, thereby increasing our 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.

"You are highly likely to 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 is automatically increases your margin," Leslie concluded. 🌱



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