ucf Undercover farming

NOVEMBER/DECEMBER 2026 I Volume 23 No 6 I R45.00 per issue



Grafted seedlings: Where great harvests begin. P12

El Niño: Preparing for heat and water stress. P13

Protecting blueberries against Botrytis P25

CHRISTMAS ON A PLATE!

Festive Summer Garden Salad.

Fresh, colourful and full of seasonal goodness – this salad is the perfect addition to your Christmas table.

Christmas in South Africa arrives in the heart of summer, when fresh produce is at its best. From crisp garden greens and juicy tomatoes to crunchy peppers and refreshing cucumber, the season offers an abundance of colour, flavour and goodness. This festive garden salad brings all those wonderful ingredients together, finished with creamy feta, jewel-like pomegranate seeds and fresh herbs. It's simple to prepare, beautiful to serve and a delicious way to let fresh produce take centre stage.

Ingredients

Serves 6

2 cups mixed salad leaves (lettuce, rocket and spinach)
1 cup cherry tomatoes, halved
1 red pepper, diced
1 yellow pepper, diced
1 cucumber, sliced
½ cup mangetout, thinly sliced
½ cup mung bean sprouts
½ red onion, thinly sliced
100 g feta cheese, crumbled
¼ cup pomegranate seeds
Fresh basil or mint leaves
For the dressing
3 tbsp extra virgin olive oil
1 tbsp balsamic vinegar
1 tsp honey
Salt and freshly ground black pepper



Method

Arrange the salad leaves in a large serving bowl. Add the cherry tomatoes, peppers, cucumber, mangetout, sprouts and red onion. Scatter over the crumbled feta and pomegranate seeds. Whisk together the olive oil, balsamic vinegar and honey. Season to taste. Drizzle the dressing over the salad just before serving. Finish with fresh basil or mint leaves.

***NOTE**: For a more substantial salad, add grilled chicken strips or slices of ripe avocado.*
You can also substitute the feta with fresh mozzarella for a milder flavour.

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SCRIPTURE:

"See, I am doing a new thing! Now it springs up; do you not perceive it?"
— Isaiah 43:19

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Editor's Note...



As we bring another year to a close, it is a good opportunity to reflect on how far our industry has come, the challenges we have faced and the opportunities that lie ahead.

The recent Undercover Farming conference in Cape Town was a wonderful success and an important reminder of the value of bringing our industry together. The exchange of knowledge, ideas and experience, and the opportunity to build new connections, are essential to the continued growth of protected agriculture in South Africa.

A sincere thank you to everyone who helped make the conference possible: our speakers, sponsors, exhibitors, partners, delegates and organising team. Your time, commitment and support made the event what it was. Most importantly, thank you for being part of a growing industry that continues to invest in knowledge, innovation and progress.

To our growers, as we look towards 2027, I want to recognise the dedication and determination it takes to produce quality crops in an increasingly demanding environment. Changing weather patterns, rising input costs, water management and the need for greater efficiency all require sound decisions and a willingness to adapt. Your work remains at the heart of this industry. At Undercover Farming, we look forward to continuing to share relevant knowledge, practical insights and industry developments that support you in your work.

Wishing all our growers, advertisers, partners and readers a peaceful festive season and a successful, productive and prosperous 2027.

Thank you for being part of the journey. Suzanne

TOMATO SPOTTED WILT VIRUS:

Prevention Starts Before the First Symptom

Tomato spotted wilt virus (TSWV) is a plant virus that can seriously compromise tomato production, reducing plant vigour, fruit quality and marketable yield. For South African growers operating under shade nets, in greenhouses, high tunnels or other protected cultivation systems, understanding how the virus spreads and implementing preventative measures are essential to protecting crop performance.

TSWV belongs to the genus Orthotospovirus and has a wide host range that includes tomatoes, peppers, eggplants, potatoes, lettuce and numerous ornamental plants and weeds.

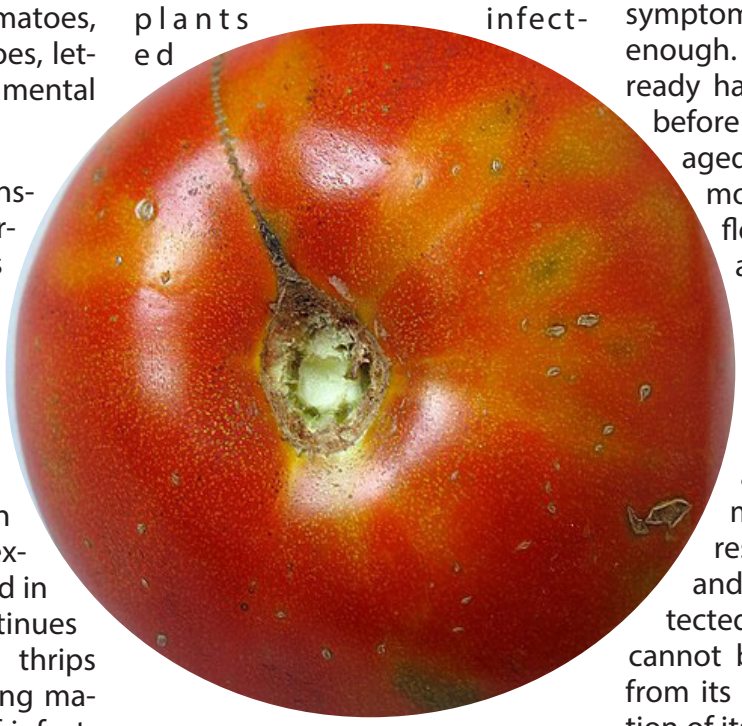
The virus is primarily transmitted by thrips, particularly the western flower thrips (Frankliniella occidentalis) and other susceptible thrips species. These tiny insects can move between infected host plants and healthy crops, introducing the virus into a production unit. Recent international extension guidance published in July and August 2026 continues to emphasise integrated thrips management, clean planting material and early removal of infected plants as central components of disease prevention.

What does TSWV do to tomato plants?

Symptoms vary according to the cultivar, plant age at infection and growing conditions. Early warning signs may include yellow or orange flecks on leaves, followed by bronzing, brown necrotic spots, leaf curling and distorted new growth. Dark streaks may develop on stems and leaf stalks, while infected plants can become stunted, wilt or suffer growing-point dieback.

Fruit symptoms are particularly damaging in commercial production. Infected tomatoes may develop pale or yellow blotches, concentric rings, uneven colouring and necrotic lesions. These symptoms reduce visual quality and can render fruit unsuitable for the intended market.

Plants infected at an early growth stage may experience more severe stunting and yield losses than plants infected later. In some cases, affected plants produce little marketable fruit.



However, symptoms alone are not sufficient to confirm TSWV. Other viruses, nutritional disorders and pest damage can produce similar signs.

Where infection is suspected, growers should isolate the affected area as far as practical, obtain a professional diagnosis and avoid moving potentially infested plants through the production facility.

How does the virus spread?

Understanding the relationship between TSWV and thrips is fundamental to prevention. Thrips acquire the virus while feeding on infected plants during their larval stage. After the virus establishes itself inside the insect, the adult thrips can transmit it to healthy plants as it feeds.

This relationship explains why controlling visible insects after symptoms appear may not be enough. Infected thrips may already have transmitted the virus before a grower notices damaged foliage or fruit. Furthermore, thrips can hide in flowers, growing points and other protected plant parts, making them difficult to detect and control.

Weeds, volunteer crops and susceptible ornamental plants can act as reservoirs for both the virus and its insect vectors. A protected tomato facility therefore cannot be managed in isolation from its surroundings: the condition of its perimeter, nearby crops and incoming plant material also matters.

Preventing outbreaks in protected cultivation

Start with clean planting material.

Purchase transplants from reputable suppliers and inspect incoming seedlings for thrips, feeding damage and suspicious symptoms. Keep new deliveries sepa-

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rate from established crops where practical, and investigate any concerns before introducing plants into production areas. Avoid raising tomato transplants alongside ornamental crops that could harbour thrips and TSWV.

Monitor thrips consistently.

Establish a routine scouting programme from the nursery stage through to harvest. Yellow or blue sticky cards can help detect flying adults, but they should complement—not replace—direct inspections of leaves, growing points and flowers. Record trap catches and observations so that changes in pest activity can be identified early. There is no single universal action threshold suitable for every protected tomato system; decisions should reflect local conditions, crop stage, pest identification and professional advice.



Improve exclusion and hygiene.

Where appropriate, install and maintain insect screens on greenhouse vents and openings, ensuring that the mesh is suitable for the relevant thrips species and does not compromise ventilation.

Repair gaps, manage access points and avoid carrying infested plant material between production units. Clean tools and equipment, remove crop residues promptly and control weeds inside and around structures. Avoid practices that inadvertently drive thrips from neighbouring vegetation into vulnerable crops.

Act quickly when symptoms appear.

Flag suspicious plants immediately and seek diagnostic confirmation. Where infection is confirmed or strongly suspected, remove affected plants promptly, following an appropriate disposal procedure that prevents thrips from escaping onto healthy crops. Do not leave discarded plants or crop residues beside the greenhouse. Continue inspecting neighbouring plants because additional infections may become visible over subsequent days or weeks.

Use integrated pest management.

No single insecticide or cultural practice provides complete protection. Where thrips control is necessary, select products registered for the crop and production system in South Africa, follow label directions and pre-harvest intervals, and rotate insecticides according to their mode-of-action groups to reduce resistance risk. Consider compatible biological control options with a qualified adviser. The timing and effectiveness of treatments matter because thrips can feed in sheltered locations and transmit the virus before control measures take effect. [1,2]

What about resistant varieties?

Where available, tomato hybrids with TSWV resistance can provide an additional layer of protection. However, resistance should not replace hygiene, monitoring or thrips management. Resistance-breaking strains have been documented internationally, and growers should consult seed suppliers about the resistance package of a particular hybrid and its relevance to local conditions.

A preventative approach protects profitability

For South African protected-crop growers, the most effective response to TSWV is a coordinated prevention strategy: clean transplants, regular monitoring, sound exclusion measures, weed control, rapid removal of infected plants and responsible thrips management.

A suspected outbreak should trigger investigation rather than reliance on symptoms alone. Confirming the disease, identifying possible entry points and reviewing pest-control practices can help growers reduce further spread and strengthen their production protocols.

TSWV cannot be cured in an infected tomato plant. Protecting the next healthy plant therefore depends on recognising risk early and acting before the problem becomes established. In protected cultivation, disciplined prevention is not an optional extra; it is an essential part of maintaining crop quality, marketable yield and production reliability. **SO.**

THE SCIENCE OF SHADE:

How Light Spectrum Shapes Crop Performance

For decades, shade netting has primarily been viewed as a way to reduce sunlight and protect crops from excessive heat and radiation. But modern protected agriculture demands a more sophisticated approach.

Not all light is the same - and not all shade nets behave the same.

The colour, construction and light-transmission properties of a shade net can influence the quantity, quality and distribution of light reaching the plant canopy. These changes can affect photosynthesis, plant structure, leaf development, flowering, fruit development, transpiration and ultimately crop performance.

Light: More Than Just Intensity

Plants respond to sunlight in two important ways.

Photosynthesis is the process through which plants use light energy to produce sugars—the energy needed for growth and development.

Photomorphogenesis, on the other hand, describes how light acts as an information signal, influencing the way plants grow and develop.

This means that changing the light environment under a shade net can influence not only how much a plant grows, but also how it grows.

Red Shade Nets – Supporting Growth and Development

Red shade nets allow a higher proportion of red wavelengths to pass through. Red light is particularly important for photosynthetic activity and can support strong plant growth under partial shade.

Potential benefits include:

- Enhanced photosynthesis
- Stimulated vegetative growth
- Improved flowering and fruit development

Red-spectrum management can therefore be particularly valuable where the objective is to maintain vigorous growth while controlling excessive solar radiation.

Blue Shade Nets – Compact, Strong Plant Growth

Blue light plays an important role in regulating plant structure and leaf development.

A blue shade net changes both the intensity and spectral composition of light reaching the crop, potentially encouraging a more compact and robust growth habit.



Key benefits include:

- Compact, stronger plant growth
- Improved leaf development
- Controlled plant architecture

This can be particularly valuable

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Process	Purpose	What Light Does
Photosynthesis	Produces energy (sugars)	Light provides the energy source
Photomorphogenesis	Controls growth and plant shape	Light acts as an information signal

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where excessive vegetative elongation needs to be managed.

White Shade Nets – Maximising Light Diffusion

White shade netting behaves differently from darker nets. Rather than simply absorbing a large proportion of incoming radiation, white filaments can reflect and diffuse light.

The result can be a more evenly distributed light environment throughout the crop canopy.

Benefits include:



- Excellent light diffusion
- Improved crop uniformity
- Better distribution of light within the canopy

This is important because leaves positioned deeper within the canopy may otherwise receive insufficient light.

Clear Shade Nets – Reducing Light Without Significantly Changing the Spectrum

A clear shade net, without colour pigments, behaves differently again.

Rather than significantly modifying the spectrum, it primarily reduces the intensity of incoming light while retaining a more natural spectral composition.

Its key advantage is therefore:

Light reduction without significant spectral change.

This makes clear constructions an attractive option where growers want to manage solar intensity and microclimate while maintaining a natural light spectrum.

Black + Clear – A Balanced Approach

Combining black and clear filaments creates a different shading environment by combining the properties of both materials.

The result is:

- Balanced light reduction
- Improved light distribution
- Reduced heat stress

A more natural spectral environment than strongly coloured constructions

This approach can provide growers with a balance between solar protection and maintaining useful light within the crop canopy.

Diffused Light: Making Better Use of the Light You Have

An important consideration in protected agriculture is not simply how much light reaches the crop, but where that light goes.

Direct sunlight can be concentrated on the upper leaves of a crop canopy, while leaves lower down may remain relatively shaded.

Diffused light can penetrate deeper into the canopy, allowing more leaves to participate in photosynthesis.

As a result, a diffused-light environment can sometimes improve crop performance even when total incoming light is slightly reduced.

In simple terms:

Shade nets optimise light distribution for the plant canopy.

Shade Also Changes the Crop Microclimate

The benefits of shade extend beyond light management.

By modifying solar radiation, shade netting can influence:

- Temperature
- Humidity
- Air movement
- Transpiration
- Respiration
- Plant water use
- Heat stress

Reducing excessive solar radiation can reduce the thermal load on plants and influence the rate at which water is lost through transpiration.

The objective is therefore not simply to block sunlight, but to create a more favourable environment in which the crop can perform effi-

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ciently.

Choosing the Right Shade for the Right Crop

Different crops - and even different growth stages of the same crop - can have different light requirements.

The right shade net can be selected according to the desired combination of:

Light intensity + light spectrum + diffusion + microclimate control.

In simplified terms:

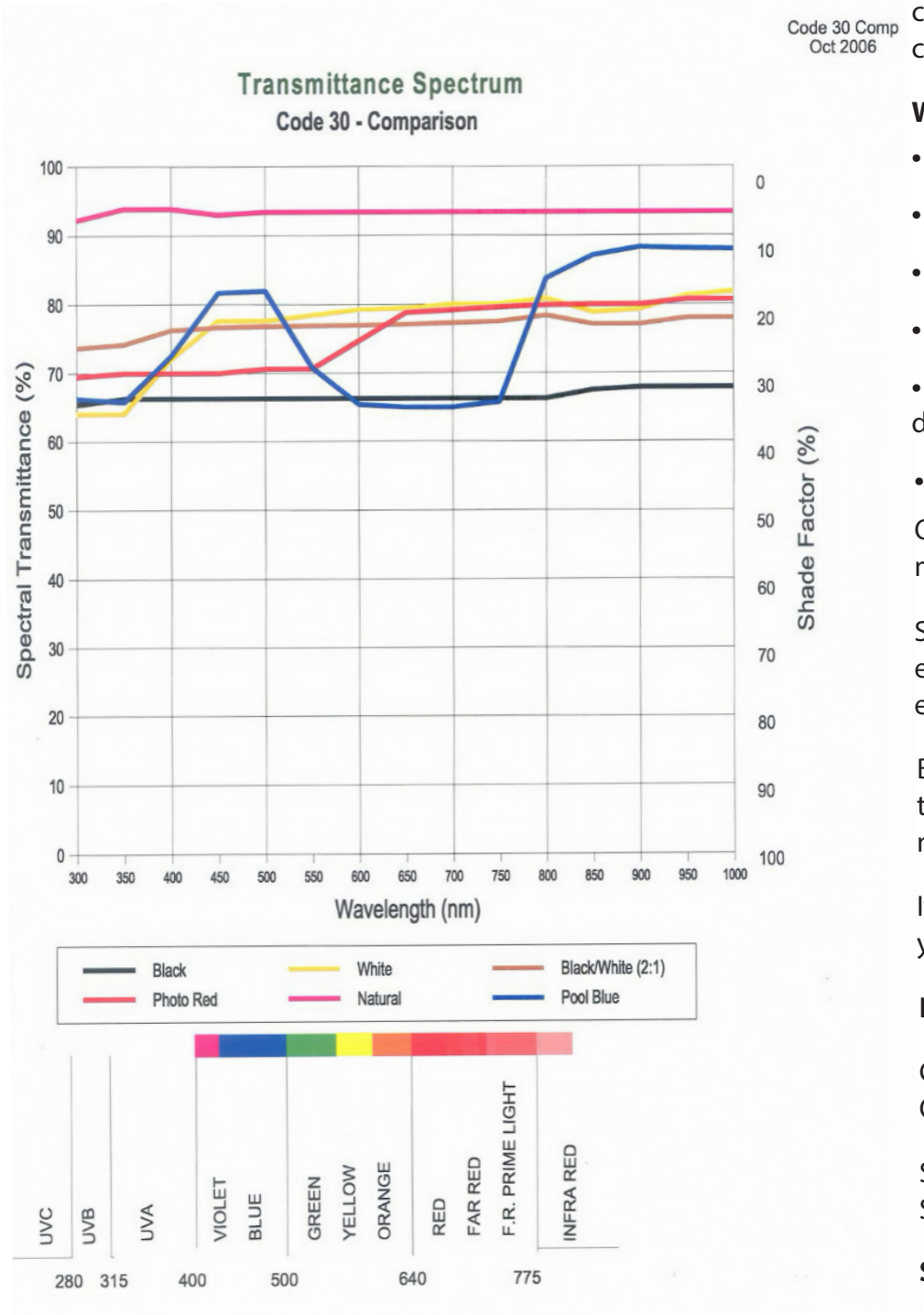
Red → supports vegetative growth (longer internodes), flowering and fruit development

Blue → encourages compact, sturdy plant growth

White → maximises diffusion and crop uniformity

Clear → reduces light intensity while maintaining a more natural spectrum

Black → primarily reduces light intensity



Black + Clear → provides balanced light reduction and distribution

There is no single shade solution that is ideal for every crop, climate or production objective.

The right shade is the shade engineered for the crop.

Knittex SpectraNet Premium – Engineered Around the Crop

With Knittex SpectraNet Premium, growers can select from approximately 4% to 95% light transmission, with net construction and colour engineered to suit specific crop requirements.

Whether the objective is to:

- Protect sensitive seedlings
- Reduce heat and solar stress
- Manage plant architecture
- Improve light distribution
- Support flowering and fruit development
- Maintain crop uniformity

Or optimise the growing environment

SpectraNet Premium gives growers greater control over the light environment.

Because the future of shade netting is not simply about how much sunlight you keep out.

It is about understanding the light you let in.

Knittex SpectraNet Premium

Control sunlight. Reduce stress. Optimise growth.

Setting the World Standard in Shade Innovation.

Source: Knittex: Deon Joubert

GROLITE® EXPANDED PERLITE FOR PROFESSIONAL HORTICULTURE

Few choices shape a crop's success as much as the medium it grows in. For growers running tunnels and shade-net structures across South Africa, Pratley Minerals' Grolite® Expanded Perlite delivers a substrate with proven, measurable properties and a well-established supply network behind it.

Grolite® is no laboratory creation. It begins as a naturally occurring volcanic mineral, which is heated until it expands into a light, porous growing medium. It holds an eco-friendly classification and is made without causing environmental harm, a point of growing importance as producers respond to sustainability requirements and the demands of export markets.

In practical terms, Grolite® tackles a core problem of root zone management: striking the right balance between drainage and moisture retention. Its expanded structure lets excess water move through while keeping the moisture roots need to develop well. Growers can therefore hold irrigation schedules steadier and cut the risk of waterlogging, a real worry in high-density production.

Air supply matters just as much to root health. Grolite® preserves ideal air porosity around the roots, which supports oxygen exchange, strong root growth, and effective nutrient uptake. Linked to this, the product makes fertiliser work harder by improving how nutrients interact at the root zone, giving healthier plants without having to apply more inputs.

Growers who put biosecurity first will value that Grolite® contains no weeds or disease-causing microbes. This lowers the chance of bringing soil-borne disease into a production system and reduces reliance on corrective chemical treatments, a useful advantage in any intensive operation. To suit varied horticultural uses, Grolite® comes in several grades: Fine (0–1mm), Medium (0–2mm), Coarse (1–3mm), and Unscreened (0–8mm). Type 2 variants are also offered, including a Coarse grade of 1–8mm and a Fine grade of 0–1mm.

Pratley Minerals holds ISO certification and belongs to the International Perlite Institute. Based at its Krugersdorp, Gauteng facility, the company serves customers at home and abroad. The perlite is sourced within South Africa and the ore is processed with proprietary technology developed in-house by the Pratley group, whose minerals processing history dates to 1974, when it opened its first perlite processing factory.

For producers seeking a natural, eco-friendly growing medium that performs consistently, Grolite® deserves a close look.

To learn more, visit www.pratley-minerals.com.



NUTRIENT FILM TECHNIQUE:

The make-or-break of your NFT system

NFT greenhouses run like a factory production line.

The greenhouse is always full and always turning over because planting and harvesting are both happening daily.

Trays of leafy greens or herbs go into the gullies at one end, while mature heads come off the other. And tomorrow the same thing again.

That daily factory-line rhythm comes down to how short the growth cycle is. Assuming the production runs as it should, lettuce could take as little as ~20 days to go from a young plant to a harvested head on its way to a buyer.

With NFTs, the payoff is predictability. You can promise the same volume every week and hold to it right through the year, and expect payment in the same weekly rhythm.

And if a planting does go wrong, you're one short cycle away from being back on track.

Wait, what's an NFT?

NFT stands for Nutrient Film Technique, and it's probably what you picture when someone says "hydroponics". As we explained in this article, hydroponics is actually any type of soil-free growing mechanism, including NFT. And NFT is where plants grow in water only. No substrate in sight.

The setup is simple. Rows of shallow channels (called gullies) sit on a gentle slope. A pump pushes a thin film of nutrient-rich water down each gully, where the awaiting dangling roots are met with flowing water. Then, the water drains back to a tank to be sent around again.



Crops are, in effect, being watered and given nutrients every second of the day while also using 90% less water than farming in soil.

Built for leafy greens and herbs

NFT is built for fast, shallow-rooted crops like lettuce, other leafy greens and herbs. In the right setup, a single plant can go from nursery to harvest in under 20 days, with mature plants being harvested daily.

NFTs allow you to produce a variety of similar crops, fast - super helpful since many leafy-green operations grow three to five crops at a minimum.

Herb growers often reach eight to ten crops at once, because offering a wide range of herbs increases their convenience and desirability for retailers.

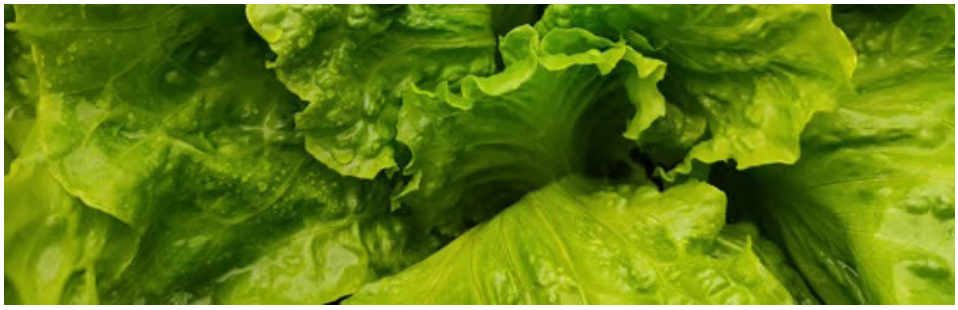
Every plant in an NFT system has its roots in the same flowing water. There's no separate irrigation schedule for rocket versus coriander versus butter lettuce. It's one system supporting a wide mix of crops with the same film and regime.

And because the plants need very little room between them, you can pack your greenhouse almost wall-to-wall, with every square metre producing.

The risk of NFT

What makes NFT work is that the water is always moving. If the flow stops because of a power outage or broken pump, you don't have long before your crops die.

When you grow in soil or substrate, moisture is held around



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the roots. If your irrigation stops, the plants still have water for days. You have a buffer of protection.

In an NFT system, the thin film flowing past the roots is the plant's entire supply of water and nutrients. There's nothing for the roots to fall back on if the flow stops.

For an NFT line, a power cut could mean an empty greenhouse. That's why backup power, dependable pumps, fail-safes that keep the water moving, and a stock of spare parts aren't optional extras. Reliability and the ability to act fast are key.

What matters most for your water?

Water temperature and cleanliness are vital to NFT crop yields.

Temperature

Did you know that warm water holds less dissolved oxygen than cool water?

That's why an NFT system needs its water to be kept around 18 to 22°C: warm enough for healthy nutrient uptake, cool enough to keep oxygen high. In hot conditions, growers sometimes chill the water or dose extra oxygen into it. Because if it runs warm and oxygen-starved, you've brewed the perfect conditions for root-rot pathogens like Pythium.

Cleanliness

With NFT, you have the same body of water touching every plant, over and over, all day. So whatever gets into that water doesn't stay in one corner. It travels the whole system.

A disease that would damage a single bed in a soil crop can move through your greenhouse in no time. With leafy greens, which often reach the plate raw, there's an extra food-safety layer you'd need to adhere to - and that unclean water could risk.

It starts in a nursery

There's one piece of an NFT operation that farmers almost always underestimate - the starter plants.

If you're planting several crop varieties daily or even weekly, you need a steady supply of specific daily quantities of great quality young plants. Try get that from an outside nursery, and the logistics can become a nightmare. Even worse if your farm is rural or sits across a border.

That's why commercial NFT operations almost always have their own nurseries: a clean path from seed to seedling to channel. Having access to your own starter material not only lets you control the quality, but it's also what lets the line run without interruption.

Building one isn't a side task. There's real art and science to creating the right growing environment for seedlings. And getting it right matters more for NFT than almost anywhere else because of the production line that wasn't designed to have any gaps.

Let's make your NFT setup low risk and high reward

NFT, done properly, isn't a clever piece of kit you install and switch on. It's a production line with real benefits and real fragility.

With very little room for error, the gap between high-reward and high-risk is almost entirely a question of system design, including the backups that keep the water moving, the control that keeps it cool and clean, and the nursery that keeps it fed. So if you're weighing up a leafy-green or herb operation, the question isn't "should I use NFT?" It's "how do we build a production line that doesn't stop?"

That's a conversation we'd like to have with you. Reach out on +27 21 987 6980 or info@vegtech.co.za

Source: Vegtech/Netafim



HISHTIL SOUTH AFRICA: WHERE GREAT HARVESTS BEGIN

Top-shelf seedlings, grown for South African conditions

Every undercover farmer knows the crop is won or lost long before the first fruit sets. It starts with the seedling. In South Africa, one nursery has built its reputation on getting that first step right: Hishtil.

Fifty years of plant science

Hishtil was founded in Israel in 1974 and has grown into a global nursery corporation producing vegetables, herbs and young plants. Its parent describes itself as a world leader in knowledge-based plant propagation. That expertise reached South Africa when the first Hishtil nursery opened its greenhouse doors to farmers on 14 June 2007.

Built for local conditions

Hishtil SA is based in Mooketsi, Limpopo, at the centre of the country's vegetable-producing regions. Its seedlings are grown in high-tech greenhouses custom designed for the harsh South African climate, fully covered and protected by insect-proof netting so disease-carrying vectors cannot enter. For growers farming under cover, biosecurity matters: a clean start means fewer problems inside the tunnel. In 2014, Hishtil SA opened another state of the art facility in Riebeek West, in the Western Cape.

Grafting pioneers

Hishtil SA is the first nursery in South Africa to graft vegetable seedlings commercially. Grafting joins a productive plant to a strong root system, giving growers vigour and disease resistance. The group's wider work in hybrid seedlings with stronger roots also means less reliance on pesticides. The nursery also introduced its Early Start plug, which Hishtil believes is new even on the international market.

Scale without losing focus

Hishtil South Africa now produces over 100 million seedlings, supplying the local market and farmers across Africa. It works with both established and emerging farmers, an important point in an industry that needs new entrants as much as established names. Its parent group complies with international standards including GlobalG.A.P. and ISO 9001.

Why it matters under cover

Protected cultivation is capital-intensive. Tunnels, irrigation, labour and time are committed the moment seedlings go in. Starting with uniform, healthy, well-rooted plants protects that investment and gives the grower a head start on yield, consistency and cropping schedules.

The verdict

Few nurseries combine international plant science, purpose-built South African greenhouses, commercial grafting experience and the capacity to supply over 100 million plants a year. That is why Hishtil belongs on any serious grower's shortlist, and why we are proud to call it a top-shelf seedling nursery. **For orders and advice, visit hishtilsa.co.za**



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SOUTHERN REGION | Riebeek West, Western Cape| Tel: +27 (0) 22 461 2508 |

EL NIÑO 2026/27:
Preparing Protected Crops for Heat and Water Stress

In September 2026, the Department of Agriculture warned that El Niño conditions are expected to influence the 2026/27 summer, with below-normal rainfall and higher temperatures forecast for many areas. These outlooks are probabilistic, and outcomes will differ between provinces, regions and neighbouring farms. Their value is that they give growers time to prepare. For greenhouse, shade-net and tunnel producers, where output depends on reliable water, managed temperatures and consistent crop development, that preparation should start now.

Know your microclimate

A protected structure modifies conditions, and the extent depends on design, covering, orientation, ventilation, shading and canopy. Greenhouses trap heat when ventilation is inadequate, shade-nets reduce radiation but can restrict airflow, and plastic tunnels heat rapidly under strong sun.

Measure inside the canopy, not just at an external weather station. Place temperature and humidity sensors at representative points, including the centre and edges of the structure.

Track duration as well as peaks. Hours spent above a crop's threshold, and whether warm nights prevent overnight recovery, often matter more than the daily maximum.



Know your crop's limits. Tomatoes and peppers, for example, are generally sensitive to sustained daytime temperatures above about 30–32°C, with pollen viability, fruit set and flower retention declining beyond that. Confirm thresholds for your cultivar and growth stage.

Balance ventilation and shading

Ventilation removes heat and moisture, while shading reduces incoming energy. Neither is a universal fix. Over-shading cuts photosynthesis, flowering and yield, while poor ventilation raises heat and humidity and favours some diseases.

Workable steps before peak summer:

- Inspect roof and side vents, fans, motors and shade mechanisms, and repair or replace damaged parts.
- Clean insect screens, since dirty or fine-mesh screens can significantly restrict airflow.
- Match shade-net choice to crop light needs, airflow, UV stability and structural loading. A shade percentage alone does not describe a net's full effect.
- Consider seasonal options such as retractable screens or temporary shade paint, removing or reducing it as conditions change.
- In drier inland regions, evaporative cooling (fan-and-pad or fogging) can lower temperatures effectively, but it uses water and works poorly in humid conditions such as the coast.

Secure and manage water

Higher temperatures and radiation raise evaporative demand, so crops need more frequent irrigation, depending on humidity, airflow, crop stage and the root zone's water-holding capacity. Review schedules before the hottest period instead of reacting to visible wilting.

Assess supply at farm level: source reliability (borehole, river, dam, municipal), storage capacity, pumping needs, water quality and any restrictions. Check that your water use is lawfully authorised under the National Water Act, and watch for municipal or catchment-level restrictions.

Inspect equipment before demand

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peaks: filters, pumps, pressure regulators, valves and emitters. Test distribution uniformity, since blocked or worn emitters waste water and create uneven crop stress.

Monitor the root zone: use soil moisture probes in soil systems, and track volume, EC and drainage percentage in substrate systems.

Adjust timing: shorter, more frequent irrigation events scheduled around radiation levels often suit substrate crops better than a few large events.

Plan contingencies: estimate daily peak consumption for the area under cover and aim to hold enough stored water for a defined number of days, with a plan for reduced supply.

Protect against power interruptions

Fans, pumps, fertigation controllers and cooling systems all depend on electricity, and load-shedding or outages during a heatwave can be costly. Review backup options such as generators, solar PV with batteries, and gravity-fed storage for critical irrigation. Test automatic changeover and confirm that controllers retain their settings after a power loss.

Manage fertigation carefully

Nutrient uptake is tied to water uptake, and extra fertiliser cannot compensate for inadequate water or unsuitable root-zone temperatures.

Monitor EC and pH of source water, feed and drainage. EC shows total dissolved salts but not individual nutrients, so supplement it with periodic leaf and water analyses.

In hot weather, high evaporation and variable uptake can concentrate salts around roots. Adjust the feed recipe based on crop response and drainage readings, not on a fixed schedule.

Do not raise fertiliser concentration to fix poor growth until you have checked water delivery, root health, EC and pH. Excess salts worsen water uptake problems.

Watch for calcium-related disorders such as blossom-end rot in tomatoes and peppers and tipburn in lettuce. These often reflect uneven water supply and high transpiration rather than low calcium in the feed.

Adjust crop management and scouting

Review crop load, pruning, leaf area and plant spacing. Maintaining adequate leaf cover protects fruit from direct radiation, while excessive load can strain stressed plants.

Schedule labour-intensive tasks and harvests for cooler morning hours, and cool produce promptly to protect quality and shelf life. Increase scouting frequency. Hot, dry conditions can favour pests such as red spider mites, thrips and whiteflies, and stressed plants are less able to tolerate damage. Keep integrated pest management programmes active and adjust them to local pest pressure.

Summer-readiness checklist

- Inspect irrigation systems and test distribution uniformity.
- Service pumps, filters and fertigation equipment.
- Review water storage, licences and contingency arrangements.
- Check ventilation, shade systems and coverings.
- Test backup power and controller settings.
- Calibrate temperature, humidity, moisture, pH and EC instruments.
- Confirm crop-specific heat thresholds and water requirements.
- Arrange access to current South African Weather Service (SAWS) forecasts and official advisories.
- Record water use, yields, quality and heat-stress incidents to inform future seasons.
- Review insurance cover for weather-related and infrastructure losses.

Prepare, then stay responsive

El Niño does not affect every location or crop equally, and forecasts should guide preparation, not replace observation of actual conditions. No single technology removes climate risk, but sound infrastructure, accurate monitoring, disciplined maintenance and crop-specific management help growers detect problems early and adjust. With summer approaching, now is the time to test your farm's capacity to handle heat, high water demand and changing conditions before they peak. **SO.**



GROWING SMARTER:
Hydroponics Built for the Realities of African Farming

Hydroponics has moved well past the novelty stage. For a growing number of producers in southern Africa, soilless growing is now a serious commercial option. It delivers more consistent quality, better use of water and fertiliser, and far higher yields per square metre than conventional open-field production. The real question for most farmers is no longer whether to grow hydroponically, but which system suits their crop, site, budget and level of experience.

At Greener Solutions, we have spent decades answering that question. We are hydroponic specialists, and we design and install a wide range of systems because no single system is right for every grower.

One size does not fit all

A hydroponic system is a production tool, and the right one depends on what you grow and where you grow it.

NFT (Nutrient Film Technique) circulates a thin film of nutrient solution through channels, with plant roots in constant contact. It is a well-established choice for lettuce and herbs, and it is highly efficient with water and nutrients.

NGS systems are another popular gutter-based option for leafy crops, offering excellent control over feeding and consistent crop timing.

Rolling bench systems make the most of greenhouse space. Benches move so that the working aisle can be created wherever it is needed, which suits high-value crops and intensive production.

Substrate drip systems grow in bags, slabs or containers filled with a medium such as coco or perlite, and are the standard for fruiting crops such as tomatoes, cucumbers, peppers and berries.

Floating raft systems suspend plants on rafts over a nutrient solution. They are another way to produce leafy greens at scale. We work with an excellent range of technology suppliers in each of these fields, which means we can specify proven equipment, irrigation controllers, fertigation units and structures matched to your operation rather than forcing your operation to fit a product.



Every one of these systems has strengths. Most of the naked-root systems, however, share one vulnerability that matters a great deal in Africa: they depend on continuous, reliable power.

The African problem: when the power goes off

Anyone farming in South Africa and across the continent knows the pattern. Power supply is unpredictable. Pumps stop, controllers go down, and a breakdown at the wrong moment can be costly.

In a system where roots sit bare in a flowing nutrient solution, an interruption of even a few hours in hot conditions can put an entire crop at risk. Systems such as NFT, NGS and aeroponics were designed in environments where stable infrastructure was a given. Here, it is a risk that has to be managed. This is the gap we set out to close, and it is why, many years ago, our design team developed a system of our own: the **Greener System**.

The Greener System: designed here, proven here

The Greener System is a fully recirculating hydroponic system developed for local conditions and

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in use for nearly 30 years. It draws on our design team's experience of growing in African conditions, and many customers in South Africa have used it with great success.

Its key difference is the rooting medium. Instead of bare roots in a film of water, plants grow in a special inert sand, chosen for optimum drainage and root development. The sand is fed by a pressure-compensated drip system, with irrigation applied in cycles rather than continuously, which saves on pumping costs.

Water that drains through the beds is captured in a trough, topped up with nutrients (manually or through a fertigation unit) and recycled back to the crop. The result is zero waste discharge on a day-to-day basis. Because doses are accurate and the water is fully recycled, the system is highly water efficient, and all fertiliser is used with nothing wasted. Low pumping requirements make it energy efficient as well.

Robustness: the deciding factor

The most important feature of the Greener System is its resilience. Because the sand holds water and nutrients around the roots, plants keep drawing on that reserve during a power failure or breakdown. They are not affected for quite long periods while the problem is rectified. For a grower in an unpredictable farming environment, that buffer is a major risk reduction, and it is the very thing that sets the system apart from other naked-root recirculating systems.



Production that holds its own

Robustness does not come at the expense of output. Plant density runs from 10 to 15 plants per square metre, depending on the crop, and growing cycles for lettuce and leafy greens such as herbs match those of the most sophisticated naked-root systems, without the risks.

Up to 15 cycles of frilly and butter lettuce per year is the norm.

In some crops and situations, harvest comes three weeks after transplant, allowing 17 cycles per year.

Spinach (swiss chard) can produce up to 250 tons per hectare, or 25 kg per square metre, per year.

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The system is best suited to leafy crops: lettuce varieties, herbs, spinach and similar crops.

Flexible layout, simple to run

Growbeds are laid out to make the best use of the production area, whether that is a tunnel, a multispan greenhouse or a shadehouse, allowing enough space for the crop's growth habit and for cultivation work. Beds are typically 1.32 m wide, depending on the crop, so that plants in the centre are within easy reach. Aisles are around 600 mm wide and covered with gravel for easy access with equipment.

The system is also easy to understand. Beginners can operate it with our initial technical growing support, and it can be designed for almost any scale, from a small-scale start-up to a full professional operation. Because it does not depend on a fully enclosed, high-tech structure, it works in shadehouses and can even be used in open field, which opens hydroponics to growers who cannot justify the cost of a high-spec greenhouse.

Commercial proof

A system is only as good as the businesses it supports. The Greener System has proven itself as a full commercial system used over many years by large professional growers supplying Woolworths, Checkers and Spar. Our largest growers run installations of up to 3 hectares (30 000 m^2), producing around five million heads of lettuce per year, and they run them profitably.

Part of that profitability is the low capital outlay. Capex is modest compared with high-tech systems, which keeps both capital and production costs favourable and supports a better return on investment than almost all other systems.

Choosing the right system for you

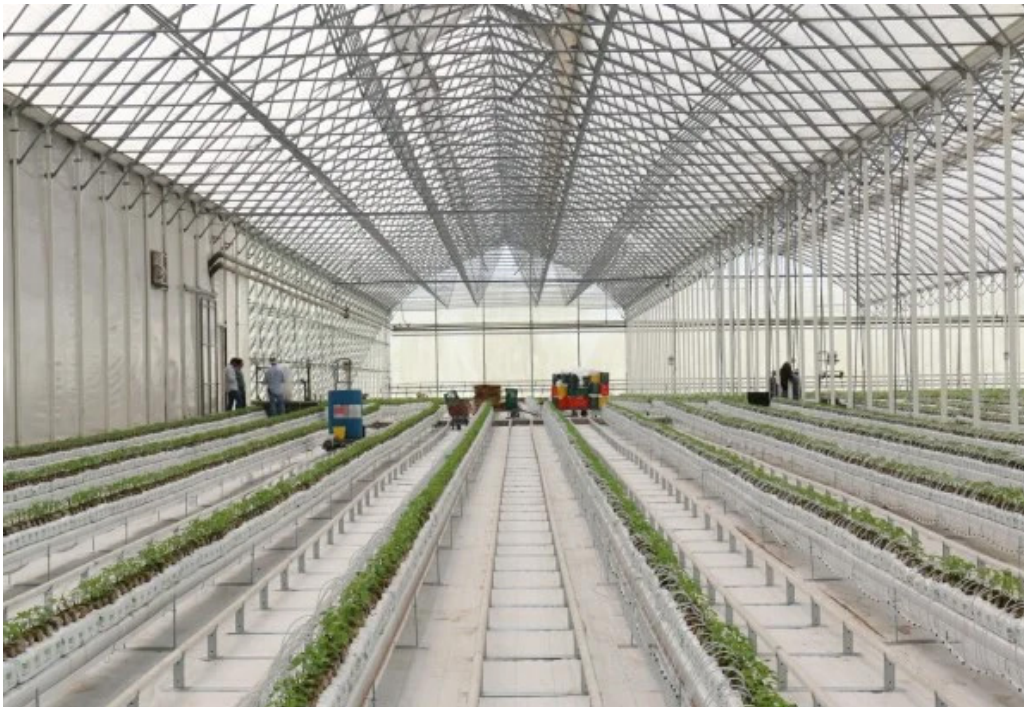
We would not claim that the Greener System is right for every grower or every crop. If you are producing tomatoes or cucumbers, a substrate drip system is the sensible choice. If you want maximum density and speed from leafy greens in a well-serviced, high-tech environment, NFT or NGS may fit your plan. Where you want leafy greens, an easy learning curve, low capital cost, resilience to power failures and the freedom to scale up or down, the Greener System is hard to beat.

That is the value of working with a specialist who is not tied to one technology. We can compare options with you honestly, based on your crop, site, power situation, market and budget, and then design, supply and install the system that suits them.

Talk to us

Whether you are a first-time grower weighing up your options or an established producer looking to expand or improve an existing operation, our team can help with system design, installation and the technical growing support to get you off to a good start.

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THE ROOT ZONE AS A WATER RESERVOIR

Using moisture, drainage and crop observations to improve water decisions under cover



In a hot summer, the root zone becomes one of the most important places on the farm to measure. Leaves show visible symptoms of stress, but causes often begin below the surface: insufficient available water, uneven irrigation, poor aeration, salinity or damaged roots. With South Africa approaching November and December under a seasonal outlook favouring warmer conditions and below-normal rainfall across many areas, growers should review how effectively their systems store and deliver water.

The root zone is a reservoir with a particular capacity, drainage pattern and balance between water and air. Managing it well means understanding the growing medium and the crop's demand, then applying water to maintain a suitable environment without unnecessary waste.

Different media behave differently

Soil, coir, rockwool and other substrates differ in water-holding capacity, drainage, air-filled porosity and how quickly moisture changes after irrigation. A schedule that works in one medium or container size may be unsuitable for another.

For soil-grown crops, consider soil texture, structure, compaction, rooting depth and moisture distribution through the profile. Water may move rapidly through some layers while remaining held in others. A dry surface does not always mean the whole root zone is dry, and a wet surface does not prove that deeper roots have adequate water.

In substrate production, container or slab volume matters. A small root volume can change rapidly under high evaporative demand. Emitter position, root distribution and drainage also affect how much water remains available.

Build a picture from more than one measurement

Moisture sensors can help growers see how the root zone changes during the day, but readings are useful only when sensors are installed and interpreted correctly. Place sensors in representative zones and at relevant depths. Avoid relying on one reading from an unusually wet, dry or shaded location.



Compare sensor data with manual checks and plant response. In substrate systems, observe representative containers, drainage volume and the timing of dry-down. In soil, use appropriate sampling or probes to assess moisture through the active rooting depth.

Keep a record linking irrigation events to the response that follows. Note when water was applied, how much was delivered, what sensors showed and whether the crop recovered or continued to show stress. Over time, this helps distinguish water shortage from a delivery fault, root disease or another constraint.

Uniformity is as important as total volume

A farm can apply enough water overall and still have stressed plants if distribution is uneven. Check pressure at the beginning and end of irrigation lines, inspect filters and regulators, and measure emitter output in representative locations. Compare flow from new and older emitters, especially where water contains suspended particles or minerals.

A uniformity audit can identify

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rows that consistently receive less water. Correct the cause - blocked emitters, pressure differences, leaks or poorly designed laterals - before increasing irrigation across the entire area. Applying more water to compensate for a local fault may overwater plants already receiving enough.

Drainage tells part of the story

Where drainage can be collected, record its volume and timing. In soilless systems, drainage helps show whether applied volume is appropriate, although the right proportion depends on crop, medium, water quality and production strategy. More drainage is not automatically better: it can represent avoidable water and nutrient loss. Too little drainage under some conditions can allow salts to accumulate.



Electrical conductivity (EC) indicates the concentration of dissolved ions, while pH provides information about acidity or alkalinity. Interpret these measurements with source-water quality, nutrient solution, crop requirements and medium. There is no universal EC or pH target for every protected crop.

If EC rises over time, investigate the source. Contributors can include high source-water salinity, excessive nutrient concentration, insufficient leaching where required, uneven irrigation or changing crop uptake. Do not automatically add fertiliser or flush the system without diagnosing the issue.

Water stress and oxygen stress can look similar

Wilting does not prove the plant simply needs more water. Roots require oxygen as well as moisture. Persistently saturated soil or substrate can restrict oxygen supply and impair root function. A plant with damaged roots may wilt even when the surrounding medium is wet.

Look at the full pattern: root condition, drainage, odour, emitter flow, leaf symptoms and whether the problem is localised or widespread. If plants remain stressed despite adequate moisture, investigate root health, salinity and disease with a qualified crop adviser.

This distinction matters in hot weather, when the instinct may be to increase irrigation frequency. More frequent irrigation may be appropriate in some systems, but only if the medium can drain and retain an adequate air-water balance.

Adjust irrigation to the day and crop stage

Demand changes with radiation, temperature, humidity, wind, canopy size, fruit load and plant development. A fixed timer can provide consistency, but the programme should be reviewed as conditions change. Where controls allow it, irrigation can be divided into events that better match demand and the root zone's storage capacity.

Avoid copying another grower's schedule without accounting for crop, planting density, emitter flow, substrate volume and water quality. Start with crop requirements and verify the result through measurements.

During hot spells, increase the frequency of checks before making broad changes. A small adjustment informed by data may be safer than a large increase in volume. Maintain records so the team can see which changes improved plant condition and which increased drainage or salt problems.

Make the root zone part of the daily walk

A daily inspection should include more than leaves. Check representative plants, emitters, moisture readings, drainage and any changes in root-zone EC or pH. Train staff to report patterns early rather than waiting until symptoms spread.

The Department of Agriculture's September 2026 El Niño advisory encourages efficient irrigation, moisture conservation and continued attention to weather and pest risks. For protected growers, these principles become practical when translated into a measured root-zone plan.

Treat the root zone as a reservoir that must be monitored - not a black box that receives water on a timer. Understanding how much water the medium can store, how evenly it is replenished and how the plant responds helps growers protect yield while avoiding unnecessary water and nutrient losses. **SO**

PROTECTING THE PRODUCTION SYSTEM:

Infrastructure, Water Delivery and Business Continuity

A summer-ready farm knows what can fail - and has a response ready

Protected agriculture depends on infrastructure working as a coordinated whole. Irrigation pumps, filters, valves, emitters, ventilation, shade, cooling equipment, sensors and power systems are links in a production chain. When one fails during hot weather, the effects can spread quickly through the crop.

With South Africa's current seasonal outlook favouring warmer-than-normal conditions and below-normal rainfall across much of the country, November and December are a sensible time to test that chain. The Department



of Agriculture has encouraged producers to use water efficiently, conserve moisture and monitor official weather information. For protected growers, preparation also means knowing which failures would have the greatest impact and how the farm will respond.

Map the critical points

List the systems that must operate for the crop to survive and remain marketable. These usually include water supply, pumps, filtration, fertigation, irrigation distribution, ventilation, cooling, environmental controls and electricity. Rank them by how quickly a failure could affect the crop and how difficult it would be to repair.

A pump failure may be critical if there is no alternative source or storage. A sensor fault may be less urgent if staff can verify conditions manually, but it becomes serious if automated irrigation depends on that reading and nobody notices the failure. The purpose is to identify where a single fault could interrupt production. For each critical system, record the person responsible, routine inspection, spare parts needed and emergency action. Keep the information accessible to more than one staff member.

Do not stop at the pump house. Inspect the route from the water source through storage, filtration, pressure regulation, valves and irrigation lines to emitters. Check for leaks, damaged pipes, blocked filters, worn seals, pressure fluctuations and corrosion.

Measure flow and pressure at representative points. If the system has not been tested recently, compare emitter output across different rows and distances from the pump. Uneven delivery can create crop stress even when the main system appears to be operating normally.

Clean and service components according to manufacturer instructions. Keep appropriate filters and seals available, and know where to obtain replacements. Record maintenance dates and recurring faults. A repeated blockage may indicate a source-water or filtration problem that needs a permanent solution rather than another cleaning.

Plan for interruptions

Consider what happens if the normal water source is unavailable for several hours or a pump fails during a hot afternoon. How much storage is available? Which crops or compartments are most vulnerable? Can a backup pump be connected safely? Who has authority to call a technician or activate an alternative supply?

Contingency plans should be realistic. Do not assume an emergency source can be used without checking its capacity, water quality, legal requirements or connection compatibility. If backup power is available, test it under load and

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confirm it can operate the equipment that matters most. Keep fuel and maintenance arrangements aligned with safety requirements.

Where water is limited, establish priorities in advance with the production manager and agronomist. Decisions made during an emergency are more likely to be inconsistent if there is no agreed plan.

Protect automation from becoming a single point of failure

Automated controls can improve precision and reduce routine labour, but they need alarms, maintenance and a manual fallback. Check that temperature, humidity, pressure, flow and moisture sensors function and that the control system records relevant data. Confirm that alarms reach the person expected to respond.

Test what happens when a sensor loses power or gives an implausible reading. Is the system designed to fail safely? Can staff check conditions manually? Are operating instructions available if the usual technician is absent?

Keep a record of software or setting changes. If an irrigation schedule is altered, note who made the change and why. This helps diagnose unexpected outcomes and prevents informal adjustments from becoming permanent without review.

Review the building and protective materials

Inspect greenhouse coverings, doors, vents, shade systems, screens, support structures, cables and anchors. Look for tears, loose fasteners, worn moving parts and obstructions that affect airflow. After severe weather, inspect for damage before assuming the structure remains safe to operate.

Where shade or netting is installed, ensure that the supporting structure is appropriate for the material and local conditions. A replacement net may differ in weight or loading from the previous one. Seek qualified structural advice when necessary rather than relying on the fabric specification alone.

For fan-assisted ventilation, check motors, belts, shutters and guards. For evaporative cooling, inspect pumps, nozzles, filters and water distribution. Ensure maintenance can be carried out safely and staff know how to isolate equipment before servicing it.

Include crop protection in continuity planning

A disruption can create conditions that favour pests or disease. A ventilation failure may change humidity and temperature; an irrigation interruption can stress plants; and a rushed chemical treatment may conflict with a biological-control programme. The emergency plan should include scouting and crop assessment after a system fault, not just mechanical repair.

If biological control is being used, maintain current compatibility information and know how an emergency application may affect the programme. Record interventions and monitor the crop after the system is restored.

Train people, not only maintain equipment

A plan is useful only if staff understand it. Conduct short pre-season briefings and, where practical, a simple practice exercise. Make sure workers know how to report a leak, blocked filter, unusual crop symptoms or failed fan. Identify who can isolate equipment and who is authorised to change irrigation or fertigation settings.

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Keep emergency contact details for suppliers, technicians, electricity support and water providers up to date. Where a critical component has a long lead time, identify an alternative source or appropriate spare before it fails.

Use a maintenance calendar

A practical calendar can divide tasks into daily, weekly and monthly checks. Daily checks might include water pressure, alarms, crop-zone temperature and unusual leaks. Weekly checks could include filter inspection, emitter sampling and review of water-use records. Monthly tasks might include a broader equipment inspection, backup-power test and review of spare-parts stock. The exact frequency should follow manufacturer instructions and farm conditions.

The important point is consistency. Maintenance should be recorded and assigned, not left as an informal task postponed whenever the team is busy.

Continuity protects crop value

A protected-crop operation is a business as well as a growing environment. A short interruption can affect yield, quality, labour planning, delivery commitments and customer confidence. Business continuity planning connects the technical side of production to those commercial consequences.

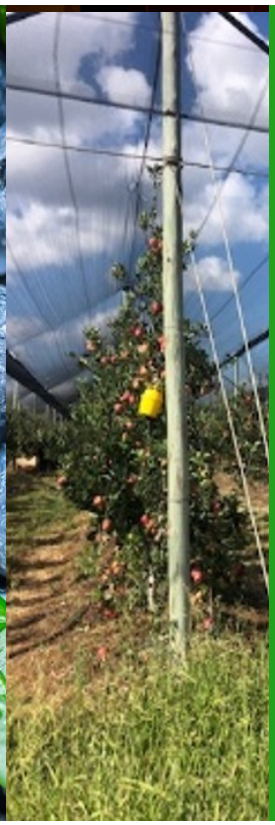
Before the summer peak, identify the most serious risks, check the equipment, confirm the water plan and agree on the response to failure. The Department of Agriculture's September 2026 advisory is a reminder to prepare for weather-related risk rather than wait for its effects to become visible.

The most resilient farm is not the one that assumes nothing will go wrong. It is the one that finds weaknesses early, keeps critical equipment serviceable, trains its people and has a practical plan when something fails. In a hot season, that preparation can make the difference between a manageable interruption and a costly crop emergency.**SO.**









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BIOLOGICAL CROP PROTECTION UNDER COVER:

Building an Integrated Pest Management Programme

Protected cultivation can improve consistency, but it can also create favourable conditions for pests when crops are grown continuously, plant material moves between compartments or an infestation becomes established in a dense canopy. Insects and mites can multiply quickly under suitable conditions, while a closed structure may limit the natural movement of beneficial organisms. The answer is not to rely on one product or one biological agent. It is to build an integrated pest management (IPM) programme around prevention, monitoring, crop knowledge and timely intervention.

This is relevant as growers move into the warmer November–December period. The Department of Agriculture's September 2026 advisory notes that hot conditions can be associated with pest and disease concerns and encourages continued scouting and appropriate control measures. Temperature alone does not determine pest pressure, but it is a reminder to review the programme before problems escalate.

Start with prevention and hygiene

A clean production system reduces the opportunities pests have to enter and establish. Inspect incoming seedlings and plant material before they reach the main crop. Keep doors, vents and screens in good condition, avoid gaps around openings, and remove crop residues and weeds that can act as hosts. Manage discarded plant material so pests do not return to the production area.

Workflows matter. Where possible, move from clean or young crops to older or infested production systems rather than carrying pests on clothing, tools or carts into vulnerable areas. Clean equipment between production systems and make sure staff understand why hygiene procedures are in place.

A production system that has been harvested or cleared provides an opportunity to remove residues, clean surfaces and assess what happened during the previous crop. Use the break to correct recurring weaknesses instead of repeating the same cycle unchanged.

Scouting, prevention and compatibility are essential when beneficial organisms are part of the plan

Scout on a schedule

IPM depends on knowing what is present before a pest population becomes difficult to manage. Establish a scouting route and frequency suited to the crop, structure and known risks. Inspect growing points, leaf undersides, flowers and fruit where relevant. Use sticky cards or other monitoring tools as appropriate, but do not rely on them alone: traps indicate activity, while direct plant inspection helps establish where pests are feeding and how the crop is responding.

Record the pest, life stage, location, numbers or trend, crop stage and beneficial organisms observed. A production system map can show whether a problem begins near an entrance, a vent, a planting batch or a particular row. This helps focus interventions and reveals how pests may be moving.

Train scouts to distinguish pests from beneficial insects and recognise early symptoms. If identification is uncertain, obtain expert confirmation before selecting a control. Treating the wrong organism wastes money and can disrupt beneficial populations.

Match the biological tool to the pest and crop



Biological control is not a generic substitute for chemical spraying. Different beneficial organisms have different prey preferences, temperature tolerances, movement

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patterns and release requirements. A programme suited to aphids in one crop may not be suitable for whiteflies, thrips, mites or tomato leafminer in another.

A September 2026 report on Koppert South Africa's work in commercial horticulture highlighted the need for locally adapted programmes and careful consideration of pest and beneficial behaviour, including challenges associated with Tuta absoluta in tomatoes. The practical lesson is to build the programme around the specific crop and pest rather than assume a beneficial organism will perform equally well in every greenhouse.

Discuss release timing, application rate, distribution and repeat releases with the biological-control supplier or qualified adviser. Ensure that crop conditions and prey availability are appropriate. Monitor whether beneficial organisms establish and whether pest populations decline. Releasing beneficials without follow-up monitoring makes it difficult to judge success.

Compatibility with crop-protection products is critical

A biological programme can be undermined by a pesticide or fungicide that harms beneficial organisms. Compatibility varies by active ingredient, formulation, dose, application method and the species being used. Do not assume a product is safe for beneficials because it is described as selective or has been used successfully in another crop.

Before treatment, check current compatibility information from the biological-control provider and the product label. Consider residual effects and any waiting period before releasing beneficials again. If a chemical intervention is necessary, select it as part of the programme rather than as an isolated emergency decision.

Keep a record of every crop-protection application, including product, active ingredient, date, treated area and reason for use. This helps advisers assess compatibility and supports resistance management. Follow South African registration requirements, label directions, pre-harvest intervals and worker-safety precautions.

Use thresholds and trends

Not every pest sighting requires an immediate intervention. The appropriate response depends on the pest, crop stage, market tolerance, beneficial activity and the rate at which the population is changing. Establish action thresholds with a qualified crop adviser and review them for the crop and market being served.



A small population that is stable or declining under effective biological control may need a different response from a rapidly increasing infestation in a sensitive crop stage. Monitoring supports a proportionate decision; it is not a reason to wait until visible damage is widespread.

Where possible, compare the same sampling locations over time. Consistent records make trends meaningful and help distinguish a temporary observation from a developing outbreak.

Design for resilience

Structure design and crop management influence how easily pests move and how well monitoring works. Large compartments may offer operational efficiencies but require a deliberate scouting and response plan. Screens can help exclude some pests, but effectiveness depends on mesh specification, installation quality, maintenance and airflow implications.

Inspect screens for tears and gaps, ensure doors close properly, and manage weeds and volunteer plants around the structure. Where production continues year-round, plan crop breaks and sanitation so pests do not simply move from an old crop to a new one.

Make the team part of the IPM system

Provide clear instructions on scouting, hygiene, reporting and application records. Explain who should be contacted when a new pest is found and who is authorised to approve a treatment. Make sure workers understand the importance of not moving plant material or tools from an infested area into clean compartments without appropriate procedures.

Review the programme after each crop cycle. Which pests appeared first? Which interventions worked? Were beneficial organisms released at the right time? Did a chemical treatment disrupt control? Were there repeated hotspots? Use the answers to update the plan.

Biological control works best as part of a coordinated system that includes exclusion, hygiene, monitoring, cultural practices and carefully selected interventions. It is not a promise of zero pests, nor does it remove the need for sound agronomy. For November and December, review pest risks before temperatures rise, confirm the availability and delivery timing of beneficial organisms, check pesticide compatibility and tighten scouting. Early detection gives the grower more choices. **SO.**

BOTRYTIS IN BLUEBERRIES:

The time to act is before the mould appears

For South Africa's blueberry growers, Botrytis is a threat that demands attention long before a grey, fuzzy berry appears in a punnet. By the time the familiar symptoms of grey mould become visible, an infection may already have been established in the orchard, leaving producers to manage the consequences through harvesting, packing and export.

The challenge is particularly relevant as the 2026 blueberry season progresses. South Africa's ex-port-focused industry operates in a demanding environment where fruit quality, firmness, shelf life and delivery consistency influence commercial returns. A berry that looks perfect at harvest but develops decay during transport can undermine the value of an entire consignment.



The answer is not simply more fungicide. It is a disciplined, integrated approach that combines prevention, monitoring, appropriate chemical control, careful harvesting and uncompromising postharvest management.

Understand the enemy before fighting it

Botrytis cinerea, the fungus responsible for grey mould, is an opportunistic pathogen that thrives when susceptible plant tissue encounters favourable moisture and temperature conditions. It can infect blueberry flowers and developing fruit, while infections may remain inconspicuous until conditions favour disease development.

This creates a particular problem for blueberries because flowering, fruit development and ripen-ing can overlap on the same plant. Growers may therefore be managing susceptible flowers and harvest-ready berries simultaneously, complicating spray decisions and increasing the im-portance of block-specific monitoring.

South African production conditions add another dimension. In the Western Cape, rainfall and ele-vated humidity around flowering can create favourable conditions for infection. Northern produc-tion regions may experience different disease pressures, but a drier climate does not eliminate the risk. Local weather, irrigation practices, cultivar characteristics, canopy density and orchard his-tory must all inform the management strategy.

The first principle is straightforward: do not wait for visible mould before taking action.

Make the orchard less hospitable

Effective Botrytis management begins with reducing the conditions that allow the fungus to estab-lish and multiply.

Canopy management is central to this effort. Overly dense growth restricts airflow, prolongs moisture retention and makes effective spray coverage more difficult. Appropriate pruning and canopy maintenance improve air movement, help foliage and fruit dry more quickly, and allow workers to inspect plants more effectively.

Orchard sanitation is equally important. Dead leaves, diseased berries, damaged plant material and pruning debris can provide substrates on which the fungus survives and produces spores. Re-moving and appropriately disposing of infected material reduces potential sources of inoculum. Weed management also matters, particularly where weeds create dense, humid conditions or in-terfere with airflow.

Irrigation should be scheduled with weather conditions, soil moisture and crop requirements in mind. Avoid unnecessary wetting of plant surfaces, and pay particular attention to irrigation deci-sions when rain is forecast or berries are vulnerable to cracking. Damaged fruit offers additional opportunities for decay organisms to establish themselves.

These measures are not substitutes for a disease-control programme. They reduce the pressure that the programme must manage.

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Turn monitoring into a management decision. A proactive grower does not rely on a calendar alone.

Regular scouting should focus on flowering blocks, cultivars with a history of decay, areas with poor airflow and locations that remain wet for longer after rainfall or irrigation. Inspect flowers, fruit, leaves and damaged plant material, recording findings so that emerging problems can be compared across blocks and seasons.

Weather information should support these observations. Rainfall, relative humidity, temperature and leaf-wetness duration can help identify periods when infection risk rises. Where suitable disease-risk tools are available, they can strengthen decision-making, but they should complement rather than replace field inspections.

The practical objective is to identify risk early enough to respond appropriately. A block with a his-tory of Botrytis facing prolonged wet conditions should not necessarily receive the same treatment as a well-ventilated block experiencing dry weather.

Monitoring must also extend beyond the orchard. Recording decay during grading, packing and subsequent quality assessments can help growers identify recurring problems and trace them back to particular blocks, harvest dates or handling practices.

Use fungicides strategically, not automatically

Fungicides remain an important component of Botrytis management, but indiscriminate applica-tions are not a sustainable solution.

Botrytis is capable of developing resistance to fungicides. Repeated reliance on products with the same mode of action can reduce their effectiveness, leaving growers with fewer reliable options when disease pressure increases.



A responsible programme should therefore be developed with a qualified crop adviser and based on products currently registered for blueberries in South Africa. Growers should follow label in-structions, maximum application limits, preharvest intervals and the residue requirements of their intended export markets.

Rotating fungicides according to their Fungicide Resistance Action Committee (FRAC) mode-of-action groups is essential. Changing product names does not necessarily constitute a meaningful rotation if the active ingredients belong to the same group.

Application quality is just as important as product choice. Correct equipment calibration, suitable application timing and adequate coverage of susceptible plant surfaces all influence performance. During flowering, pollinator safety must also be considered when selecting products and schedul-ing applications.

Biological products and other alternative treatments may have a role within an integrated programme, but their suitability and efficacy must be established for the specific crop, conditions and intended use. No treatment should be assumed to provide complete protection.

Harvest and the cold chain: Where quality is won or lost

Even a well-managed orchard can produce fruit that deteriorates if harvesting and handling are poorly controlled.

Harvesting teams should avoid picking wet fruit wherever practicable and must handle berries gently to minimise bruising, skin damage and other injuries. Fruit should not be left exposed un-necessarily, and picking containers must be kept clean. During periods of elevated disease risk, harvest schedules should be reviewed so that vulnerable blocks receive appropriate attention.

At the packhouse, damaged, soft

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or decaying berries must be removed before packing. Equipment, contact surfaces, containers and handling areas require effective cleaning and sanitation to reduce contamination risks. Rapid removal of field heat and uninterrupted refrigeration are critical. Cooling slows fruit deterio-ration and fungal development, but it does not eliminate an infection already established. Botrytis can continue developing at temperatures close to 0°C, which makes effective temperature man-agement essential rather than optional.

Packaging and postharvest treatments must also be selected carefully, taking account of fruit quality, market specifications, residue requirements and the intended supply chain. Any treat-ment, including sulphur dioxide-based systems where used, must be appropriate for the product and destination.

Protect the value of every berry

For South African blueberry growers, Botrytis management is ultimately a commercial decision as much as an agronomic one. The cost of prevention must be weighed against rejected fruit, reduced pack-out, shorter shelf life, claims and lost customer confidence.

The industry needs to move beyond treating grey mould as an isolated spraying problem. It requires a coordinated approach that begins with orchard design and sanitation, continues through risk-based monitoring and responsible fungicide use, and ends with disciplined harvesting, packing and cold-chain management.

The most important question is not whether Botrytis can be eliminated from blueberry production. It cannot realistically be eradicated from the production environment. The question is whether growers can reduce infection opportunities, detect rising risk early and prevent manageable or-chard problems from becoming costly postharvest failures.

The answer lies in acting before the symptoms appear. In an export market where quality must sur-vive every stage between orchard and customer, that discipline can make the difference between fruit that merely reaches the market and fruit that arrives in saleable condition. **SO**







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RED SPIDER MITE ON GREENHOUSE CUCUMBERS:

Stop the Spread Before Yield Suffers

Red spider mite is a potentially serious pest in greenhouse cucumber production. If left unmanaged, populations can increase rapidly, damaging foliage, weakening plants and reducing marketable yields. For South African growers using greenhouses, tunnels and other protected cultivation systems, early detection and effective pest management are essential to preventing an infestation from spreading throughout a crop.

The pest most commonly responsible is the two-spotted spider mite (Tetranychus urticae). Despite its name, it is not an insect but an arachnid. Its colour can vary from yellowish-green to orange-red, depending on its life stage and environmental conditions. Two dark spots are often visible on either side of its body, although a hand lens may be needed for accurate identification.

What does red spider mite do to cucumbers?

Spider mites feed by piercing individual plant cells and extracting their contents. The first signs of an infestation are usually small, pale speckles on the leaves. As feeding continues, the affected areas become more extensive, causing leaves to turn yellow, bronze and eventually dry out.



Under heavier infestations, fine silk webbing may appear on the undersides of leaves and spread across foliage and stems. Moving mites, eggs and webbing are important indicators of an established infestation.



Leaf damage reduces the plant's photosynthetic capacity, affecting its ability to support fruit development. Severe infestations can weaken plants, reduce yields and compromise fruit quality. Early identification is therefore critical to limiting production losses.

Why does it spread so quickly in greenhouses?

Warm, dry conditions favour the development and reproduction of two-spotted spider mites. Greenhouses can provide particularly suitable conditions when temperatures rise, humidity is low and plants experience water stress.

Under favourable temperatures, spider mites can complete their development from egg to adult within a short period. This allows populations to increase rapidly, sometimes between routine crop inspections.

Mites spread through direct movement between touching leaves and neighbouring plants. They can also be carried on workers' clothing, tools, equipment and infested plant material. Air currents can assist their dispersal, while infected transplants and nearby host plants can introduce mites into previously clean production areas.

An infestation that begins on a few plants can consequently become a greenhouse-wide problem if it is not identified and contained.

Prevention starts with monitoring

Inspect plants regularly.

Do not wait for webbing to appear

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before investigating. Examine the undersides of older leaves, particularly those showing pale stippling, using a hand lens. Tapping an affected leaf over a white sheet of paper can also help reveal moving mites. Pay particular attention to greenhouse edges, areas near vents and doors, dusty sections and plants showing signs of stress. Mark affected plants and record where infestations occur. During warm, dry conditions or periods of increased pest pressure, increase scouting frequency. Twice-weekly inspections can be a useful starting point.

Keep incoming plants clean.

Inspect transplants before introducing them into the greenhouse. Where possible, keep incoming plant material separate until it has been checked. Remove volunteer plants and weeds inside and around production structures, as these can provide alternative hosts.

Manage the greenhouse environment.

Maintain consistent irrigation and avoid unnecessary plant stress. Monitor temperature and humidity, and use ventilation to manage excessive heat where practical. Good environmental management supports healthy crops, although increasing humidity alone is not a reliable method of controlling spider mites.

Control movement between crop sections.

Establish clear hygiene procedures for workers, tools and equipment. Work in clean sections before moving into infested areas. Remove heavily infested plant material carefully and dispose of it appropriately to prevent mites from spreading to healthy plants.

Integrated pest management is essential



No single treatment provides complete control. An integrated pest management (IPM) programme combines regular monitoring, crop hygiene, environmental management, biological control and, where necessary, chemical intervention. Predatory mites can be effective biological control agents against two-spotted spider mites in protected cultivation. The appropriate species and release strategy depend on the pest population, temperature, humidity and growing conditions. Consult a biological-control supplier or crop-protection adviser to select a suitable option. Introducing beneficial mites while pest populations are still low is generally preferable to waiting until extensive webbing develops.

Where chemical intervention is necessary, use only products registered for the relevant cucumber crop and production system in South Africa. Follow label instructions, including application rates, protective measures and pre-harvest intervals. Check compatibility with beneficial organisms and rotate products according to their modes of action to reduce the risk of resistance developing.

Application coverage is particularly important because mites and their eggs are commonly found on leaf undersides. One treatment may not control every life stage, making follow-up monitoring essential. Any repeat application must comply with the product label and professional recommendations.

Broad-spectrum insecticides can also harm beneficial organisms, potentially allowing spider mite populations to rebound. Chemical treatments should therefore form part of a planned management programme rather than being used as a last-minute response to visible damage.

Protect the next crop

At the end of a production cycle, remove cucumber plants and crop residues promptly. Clean growing structures and equipment, inspect areas where mites may persist and control weeds and volunteer host plants before introducing the next crop. For South African greenhouse cucumber growers, the priority is clear: identify red spider mites early, limit their movement between crop sections and combine appropriate control measures before populations escalate.

Consistent monitoring, good greenhouse hygiene and integrated pest management remain the strongest foundations for protecting cucumber crops, maintaining fruit quality and reducing avoidable production losses. **SO.**

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