



**GROW  
MACHINES**

**2026**

# **HALLELUJAH NFT TRELLIS CROP SYSTEM**

**AN ADAPTABLE COMMERCIAL  
HYDROPONIC PLATFORM FOR TRELLISED,  
FRUITING AND OTHER CROPS**

The Hallelujah System is designed to grow with your production needs. Each project is planned according to your crop, climate, market, site and desired production scale.





# WHAT IS THE HALLELUJAH SYSTEM?

01

## **One production platform for different crops and seasons**

The Hallelujah NFT Trellis Crop System is a recirculating hydroponic production system. NFT (Nutrient Film Technique) means that a thin layer of nutrient solution flows through the growing channels and along the plant roots before returning to the reservoir for recirculation through the system.

The system was originally developed for larger trellised and fruiting crops with extensive root systems. It combines spacious growing channels, a recirculating nutrient loop, plant support and a Plant Life Support System (PLSS). It is particularly suitable for crops such as tomatoes and cucumbers but can also be adapted for other crops and seasonal production programmes.

## **What does “Trellis Crop System” mean?**

The name refers to vining crops that are trained and supported vertically. There is no physical trellis or frame against which the plants grow.

Instead, each plant is supported by an individual training string. These strings are attached to strong horizontal support lines known as Deltex lines.

This allows the producer to train and manage trellis crops effectively as they grow.





# HOW DOES THE SYSTEM WORK? 02

## The plant's critical root environment is continuously supported

### 1. The nutrient solution is prepared

The producer prepares the nutrient solution in the system's reservoir. The producer monitors and adjusts the nutrient solution according to the crop, water quality and growth stage.

### 2. The nutrient solution is circulated

The pump system moves the nutrient solution through the production cell and growing channels.

### 3. The root zone is supplied

The plant roots have access to water, dissolved nutrients and oxygen in a controlled root environment. The spacious growing channels provide more room for large root systems than conventional narrow NFT profiles. This makes the system particularly suitable for larger, long-season fruiting and trellis crops.

### 4. The nutrient solution returns

The nutrient solution flows through the growing channels and then returns to the reservoir, where it is recirculated through the system.

### 5. The PLSS supports the production process

The Plant Life Support System assists with circulation, aeration and other important functions needed to manage the plant's root environment.

The final reservoir, pump and PLSS configuration is designed by Grow Machines according to the size and requirements of each project.



# WHICH CROPS CAN BE PRODUCED?

03

## Adapt your production to your market and season

The Hallelujah System was originally developed for larger trellis and fruiting crops but is not limited to a single crop or cultivar.

### Crops produced in the system

Many tomato and cucumber cultivars have performed exceptionally well in the system. Strong practical results have also been achieved with:

*Chillies*

*Baby marrows*

*Eggplants*

*Pumpkins and squashes*

*Tomatoes*

*Cucumbers*

*Watermelons*

*Leafy crops*

*And many more...*

Different crops and cultivars have also been grown successfully in the same nutrient solution when pH and EC were properly managed.



### Seasonal flexibility

When cold or frost limits the production of warm-season crops, the same production infrastructure can be used for hardy winter crops such as broccoli, cauliflower, kale, pak choi and other leafy vegetables.

This allows you to adapt your crop selection according to the season, local climate, market demand and available opportunities.

### Important management note

Different crops do not always require the same nutrient concentration or management conditions. Crop combinations must therefore be carefully planned and managed. Plant numbers and production capacity are determined specifically for each project according to the crop, cultivar and desired production method.



# CLIMATE AND ROOT-ZONE MANAGEMENT

04

## Support the plant where it matters most

The Hallelujah System places strong emphasis on managing the plant's root environment. Nutrient solution temperature, oxygen availability, water movement and ventilation can significantly influence plant development.

### Hot conditions

On hot days, cooling towers can be used to cool the circulating nutrient solution and help stabilise the root zone. A cooler nutrient solution can support higher levels of dissolved oxygen and help plants remain active during hot conditions.

### Cold conditions

Where cold conditions limit production, an in-line heater can be used to warm the nutrient solution and root zone.

*The suitability and capacity of cooling or heating equipment are determined according to the project's climate and production requirements.*

## The protected production environment

The system can be installed inside a suitable tunnel, net house or other protected production structure.

Many clients prefer net houses because they can offer a practical balance between ventilation, heat management and cost. However, the final structure must be suited to the local climate and selected crops.

*Successful hydroponic production is not only about nutrition - the entire root zone and production environment must be managed together.*



UP TO  
1 000 000 KG  
PER HECTARE!

# PRACTICAL EXPERIENCE, PRODUCTION POTENTIAL AND PATENT PROTECTION 05

## Commercially used and further developed since 2014

The first commercial Hallelujah System was commissioned in December 2014.

Since then, the system has been improved and adapted through practical commercial experience. This development is based on actual crop production, different cultivars, changing seasons and the practical needs of producers.

*This figure represents modelled maximum potential. It is not a yield promise, production guarantee or confirmed world record.*

### **Modelled maximum tomato-production potential**

Up to approximately 1,000,000 kg of tomatoes per hectare per year.

This is equivalent to a modelled maximum potential of approximately 1,000 tonnes of tomatoes per hectare per year.

The model is based on actual client production data and certain optimal assumptions relating to:

Environmental conditions

Cultivar selection

Utilisation of the available production area

Plant and production management

Actual results will vary according to climate, cultivar, water quality, management practices, nutrition, pest and disease pressure and other project-specific factors.

### **Internationally assessed and patent-protected.**

The Hallelujah System was developed in-house by Grow Machines' owner and engineer, Wynand Bezuidenhout.

The invention was examined through the international Patent Cooperation Treaty process and recognised as new and innovative.





# A SYSTEM THAT CAN GROW WITH YOUR PROJECT

06

## No one-size-fits-all layout

The Hallelujah System is designed according to the requirements of each project. There is no single fixed standard size or published maximum cell size that applies to every client.

**Start with a size suited to your current market and management capacity. Expand strategically as your production grows.**

## Modular production cells

The Hallelujah System consists of separate production cells, with standard sizes designed for 10 m × 30 m tunnels and 15 m × 30 m net houses.

Each cell has its own Plant Life Support System (PLSS) and nutrient loop, allowing pH, EC and crop programmes to be managed separately. This simplifies maintenance, helps contain problems within a single cell and allows expansion when it becomes commercially viable.

Plant capacity and spacing are determined according to the crop, cultivar and project layout and are therefore not published as fixed figures.

## THE FINAL LAYOUT IS DETERMINED ACCORDING TO:

- The crops and cultivars you want to produce
- Your local climate
- Your market and production objectives
- The available site
- Your net house, tunnel or other protected structure
- Available water and electricity
- Operational walkways and practical access
- Your current budget
- Your future expansion plans



# INSTALLATION AND CONTROL

07

## Choose the installation option suited to your site

### Installation on a prepared surface

This is the simpler and more affordable installation option.

The prepared floor or ground surface must:

- Be flat, even, stable and well compacted
- Have no local bumps, depressions or low points
- Provide a continuous slope of approximately  $0.5^{\circ}$  to  $3^{\circ}$

A slope of approximately  $1^{\circ}$  is generally preferred.

The correct slope is important for good flow, complete drainage and efficient cleaning.

Grow Machines must be consulted before final site preparation begins.



### Installation on adjustable aluminium frames

The premium installation option raises the production rows approximately 250–400 mm above the floor.

This option provides:

- Better control of the required slope
- Easier cleaning and disinfection
- Improved airflow around the crops
- Less exposure to the humid floor layer
- A more comfortable working height
- A neat, professional appearance

The aluminium frames are corrosion-resistant and manufactured for long-term commercial use.



## System control options

### MANUAL control

MANUAL is Grow Machines' recommended option for most clients. It is simple, robust and easy to operate and maintain—especially where technical support is not readily available.

### SMART control

SMART is a premium option offering advanced control, automation and remote monitoring. It is more complex and expensive and may require additional technical maintenance. It is therefore mainly recommended for technically experienced clients.



## RELIABLE ELECTRICITY AND BACKUP POWER

08

'A reliable power supply is essential for the operation of the system. Long and unpredictable power outages can negatively affect production and the plant's root environment.

Depending on the project, Grow Machines can provide the following at an additional cost:

- A basic backup power solution with a battery and inverter
- A basic solar power system designed according to the relevant system size.

The solar-power solution can be expanded in stages as the Hallelujah production system grows.

## WHAT GROW MACHINES DOES AND WHAT YOU NEED TO PREPARE:

### GROW MACHINES

*Grow Machines evaluates the project according to the crop, climate, site, market and desired production scale. We design and manufacture the appropriate Hallelujah System, including the standard reservoir and pump system, and provide telephone guidance on site preparation and layout.*

*We can also install and commission the system at an additional cost, provide six months of mentorship after installation and offer a formal course covering the basic principles of hydroponics.*

### THE CLIENT

*The client must provide accurate project information and prepare the site, water and electrical connection points, as well as the tunnel, net house or other protected structure, according to the required specifications.*

*If planned and quoted accordingly, the client may complete most of the installation. However, the client remains responsible for the daily management of the system and crops, including water, nutrition, pH, EC, flow, cleaning, ventilation and crop health.*



# SUPPORT, INSTALLATION AND INTERNATIONAL AVAILABILITY

09

## Relatively simple installation

The systems are designed so that clients can complete most of the installation themselves if this is planned in advance.

Grow Machines can provide telephone support with the layout and preparation. If you prefer Grow Machines to install and commission the system, this can be included in the project quotation at an additional cost.

Groundwork, floor preparation and the construction or preparation of the tunnel, net house or other protected structure are not included in the standard system installation. Net houses can, however, be constructed at an additional cost.

## Support does not end after installation

Grow Machines provides the client with six months of mentorship after installation to help ensure that the operator understands the system, controls and basic management requirements.

A formal training course covering the fundamental principles of hydroponics is also available.



## International projects

Grow Machines supplies systems to clients within and outside South Africa. There is no fixed maximum export distance.

Transport, installation, support and other project logistics are planned and quoted according to the destination and scope of the project.



# LET US DETERMINE WHAT YOUR PROJECT NEEDS

10

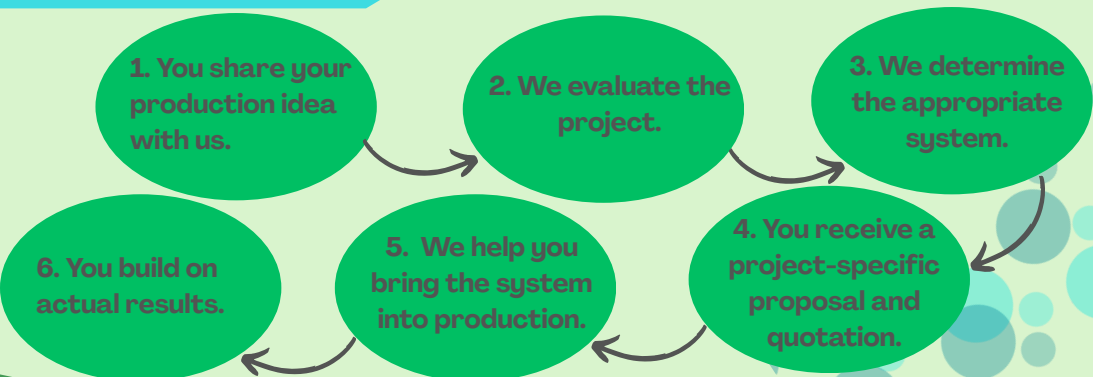
## TELL US WHAT YOU WANT TO PRODUCE

The Hallelujah System is not a predetermined, one-size-fits-all product. To determine the most suitable system type, size and layout for your project, Grow Machines requires the following basic information:

- Your project location and nearest town
- The crops and cultivars you want to produce
- Your intended market and production objective
- The available site and its dimensions
- Details of any existing tunnel, net house or protected structure
- Your water source and, if available, a water analysis
- Available electricity and backup power requirements
- The current condition and slope of the site
- Your intended starting date
- Your preferred starting scale and future expansion plans

*Start with the right system for your current needs. Build strategically for the future.*

## How the process works





# CONTACT DETAILS:



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SCAN HERE



SCAN HERE

*Tell us what you want to  
produce. We will help you  
determine the most suitable  
Hallelujah System for your  
climate, market, site and  
desired production scale.*



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