



GROW
MACHINES

2026

MODULAR NFT- RAISED BED SYSTEM

A SCALABLE HYDROPONIC
PRODUCTION SYSTEM FOR LEAFY
VEGETABLES, HERBS, STRAWBERRIES
AND OTHER COMPACT CROPS

The Grow Machines Modular NFT-Raised Bed System is designed for growers who want to produce fresh crops within a limited area and later expand their production in response to market demand, available space and budget.





WHAT IS THE MODULAR NFT-RAISED BED SYSTEM? 01



The Grow Machines Modular NFT-Raised Bed System is an elevated hydroponic production system in which plants grow without soil in purpose-designed growing channels. NFT stands for Nutrient Film Technique. This means that a thin layer of water containing dissolved plant nutrients flows through the growing channels and along the plant roots. The water then flows back to the system's tank and is recirculated through the system.

The system was developed to:

- be practical and easy to understand;
- be easy to clean and maintain;
- allow the grower to start with one module;
- allow for modular expansion later;
- and adapt to different crops and production objectives.
- The system is suitable for beginners, but can also be expanded into a commercial production operation.



Start with a system size that suits your current market, available space and budget.



HOW DOES THE SYSTEM WORK? 02

1. The nutrient solution is prepared

Water and hydroponic plant nutrients are prepared and managed in the system's tank. The grower monitors the pH and nutrient concentration according to the crop and its growth stage.

2. The nutrient solution is pumped

A pump moves the nutrient solution from the tank to the production modules.

3. The roots receive water, nutrients and oxygen

Each plant grows in an individual plant position. The roots have access to:

- water;
- dissolved plant nutrients;
- oxygen; and
- a controlled root environment.

4. The water flows back

The nutrient solution flows through the growing channels into the return channel and then returns to the tank.

5. The process is repeated

The water is reused and continuously recirculated through the system. The Plant Life Support System (LSS) supports the pump, water circulation, tank and other important functions of the plant's root environment.



THE KEY BENEFITS

Production in a limited area

03

The system uses the available space efficiently and may be suitable where:

- cultivable land is limited;
- the soil is poor or unsuitable;
- an existing tunnel or net house is available; or
- fresh produce needs to be grown closer to the market.

The same production area can be used repeatedly throughout the year.

Modular expansion

You do not need to invest in a large production facility from the outset.

You can start with:

- one module;
- a smaller number of modules; or
- a complete 10-module system.

Additional modules or independent systems can be added later.

Important management note:

The system reduces dependence on natural soil conditions, but still requires good daily management.

Better production control

The grower can monitor and manage important factors, including:

Water

Plant nutrition

pH

Water temperature

Nutrient concentration

Water flow

Plant health





WHICH CROPS CAN BE PRODUCED?

04

The system is particularly suitable for compact leafy vegetables, herbs and smaller crops that grow well in NFT growing channels.

The best results are generally achieved with plants that have a limited root volume, maintain a compact growth habit and do not require heavy vertical support.

Good production still depends on the correct management of water, plant nutrition, pH, temperature and plant spacing.

PROVEN CROPS AND GOOD STARTING OPTIONS

- Curly-leaf lettuce
- Head lettuce
- Iceberg lettuce
- Other lettuce types
- Spinach, including Swiss chard types
- Basil
- Other suitable herbs

PRODUCED IN THE SYSTEM, BUT MAY REQUIRE MORE MANAGEMENT

- Strawberries
- Baby cabbage
- Broccoli
- Long-stem broccoli
- Cauliflower
- Kale
- Other smaller brassica crops

More crop possibilities

You can also use the system for repeated-harvest crops, flowering crops, baby marrows (courgettes), and other niche-market crops.

We recommend that new or less familiar crops first be tested on a small scale before production is expanded. Should you wish to produce a crop that is not listed here, you can consult Grow Machines so that we can assess the plant's size, root growth, spacing requirements and suitability for the system.

Do not limit yourself to familiar crops—explore the system's potential further, because today's trial could become tomorrow's next market opportunity.



HARVESTING METHODS AND TYPICAL GROWING CYCLES

Different crops can be harvested in different ways in the Modular NFT-Raised Bed System. Single-harvest crops are harvested completely at the end of their growing cycle and are then replaced with new plants. With multiple-harvest crops, only the larger outer leaves or young shoots are harvested, while the plant remains in the system and continues to grow. Crops such as spinach, Swiss chard, kale, basil, certain lettuce types and other suitable herbs can be harvested repeatedly over a longer production period.

05

Typical growing cycles

Crop	Typical production guideline
Curly-leaf lettuce	Approximately 28–35 days
Head lettuce and Iceberg lettuce	Approximately 40–52 days
General planning cycle for lettuce	Approximately 42 days
Swiss chard — first harvest	Around 36 days after transplanting
Swiss chard — subsequent harvests	Approximately every two weeks upto 120 days

Swiss chard can be harvested for several months. Production may begin to decline from around day 120, after which replacement plants should be prepared and the older plants eventually replaced.

Actual growing time and harvesting performance depend on:

Crop

Cultivar

Light

Seed quality

Temperature

Plant spacing

Season

Water quality

Plant nutrition

Daily management



Very large plants, crops with extensive root systems or plants requiring strong vertical support may be better suited to the Grow Machines Hallelujah System.

Grow Machines uses these cycle times as practical planning guidelines, but a fixed yield, plant mass or growing period cannot be guaranteed for every project.



A SYSTEM THAT CAN GROW WITH YOUR PROJECT

06

One standard module — different project sizes

The Modular NFT-Raised Bed System is built from standard production modules.

You can start with one module and one independent Plant Life Support System (LSS) and later add more modules or complete independent systems.

The final layout is planned according to your crop, market, available space, budget and desired production rate.

THE STANDARD BUILDING BLOCKS

- One module is approximately 5 m × 2 m.
- Each module contains 8 NFT growing channels.
- Each growing channel provides approximately 20 standard plant positions.
- One module therefore provides approximately 160 plant positions.
- One standard Budget LSS can support 1–10 modules.
- This provides approximately 160–1,600 plant positions per independent system.
- Standard plant spacing is approximately 250 × 250 mm, but can be adjusted for larger crops.

Start with the capacity that you can manage and sell today. Expand when your market and production results justify it.

MODULAR, INDEPENDENT SYSTEMS

Each complete system has its own LSS with a tank, pump and nutrient circuit.

By using several smaller independent systems, crops can be planted and harvested at different times, while different crops or nutrient programmes can be managed separately. One system can be cleaned or replanted while the other systems continue producing. This helps spread production risk and makes future expansion easier.

The final number of modules and independent systems is determined according to your crop, production cycle, market demand, site and budget.

Start small. Measure your results. Build your market. Then expand.



PLANT PRODUCTION, CONTROL AND INSTALLATION

07

The correct production environment and system setup form the foundation of a successful project

Installation options

The system is designed to be relatively easy to assemble and connect.

With a correctly prepared site, basic tools and telephone guidance from Grow Machines, the client can complete most of the installation. Grow Machines can also carry out the complete installation, testing and commissioning for an additional fee. Transport and other project-related costs are quoted according to the location and scope of the project.



Important factors for good plant production

Successful hydroponic production does not depend on the system alone.

Water quality, plant nutrition, light, temperature, ventilation, crop selection and regular management work together to support healthy plants and a healthy root environment.

Grow Machines provides initial training and practical guidance so that the operator can understand and responsibly manage the system and its most important production controls.



System control options:

The Plant Life Support System, or LSS, can be adapted according to the size, crops and management requirements of your production operation.

MANUAL CONTROL

A simple, robust option that is easy to operate and maintain. It is the recommended choice for most beginners and growers who want to remain directly involved in daily production.

SMART CONTROL

A more advanced option that can provide greater automation and remote monitoring. It is more expensive and complex and is mainly recommended for larger or technically advanced production operations.



RELIABLE ELECTRICITY AND BACKUP POWER

08

A reliable power source is essential for the operation of the system. Long and unpredictable power interruptions can have a serious negative effect on production and the plant's root environment. Depending on the project, Grow Machines can provide the following at an additional cost:

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

The solar solution can be expanded in stages as the Modular NFT-Raised Bed production operation 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 Modular NFT-Raised Bed System, including the standard reservoir and pump system, and provide telephonic 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.



SUPPORT, INSTALLATION AND INTERNATIONAL AVAILABILITY

09

Relatively straightforward installation

The systems are designed so that a client can perform most of the installation when this is planned in advance. Grow Machines can provide telephone guidance regarding the layout and preparation. Should you prefer Grow Machines to install and commission the system, this can be included in the project quotation at an additional cost. Groundworks, flooring and the construction or preparation of the tunnel, net house or other protected structure do not form part of the standard system installation. Net houses can, however, be supplied or erected at an additional cost when included in the project quotation.

Support does not end with installation

Grow Machines provides six months of telephone and WhatsApp support after installation to help ensure that the operator understands the system, its controls and the basic management requirements. A formal training course on the fundamental principles of hydroponics is also available.

Local and international projects

Grow Machines supplies systems to clients within and outside South Africa.

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

TELL US WHAT YOU WANT TO PRODUCE

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The Grow Machines Modular NFT-Raised Bed System is configured according to your crops, market, site, budget and desired production scale. To determine the most suitable number of modules, system layout and supporting equipment for your project, we require 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 other protected structure;
- your water source and, where available, a water analysis;
- the available electricity and need for backup power or solar power;
- the condition, drainage and slope of the site;
- who will manage the system daily;
- your intended starting date; and
- your preferred starting scale, available budget and future expansion plan.

Tell us what you want to produce. We will help you plan the right Modular NFT-Raised Bed System for your market, site, budget and future growth.

How the process works





CONTACT DETAILS



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SCAN HERE



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*Tell us what you want to
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for your climate, market, site
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