



GROWING THE **FUTURE**



Sustainable
urban food

4

—
We are
HRVST

5

—
Our
technology

6

—
Our
product

9

—
Setup
and support

14





Introducing the world's most advanced technology and software for maximizing crop yields in a hyper-controlled environment—whenever, wherever—all supported by real-time data.

SUSTAINABLE URBAN FOOD

80%

of the world's population
will be living in urban
areas in 50 years

With rapid urbanization, increased adoption of healthy dietary lifestyles, and rising health and environmental concerns, demand for organic food outpaces supply year after year.

Controlled-environment agriculture will be crucial in increasing worldwide food production and security, maintaining high quality and safety, and contributing to sustainable urban farming.



WE ARE HRVST

HRVST Limited is a joint venture created in 2015 between Inventive Laboratory Inc. and Florentaise. Over a decade of research went into the development of HRVST's unique technology. The goal? To feed the world and improve yields for a variety of crops.

Inventive Laboratory Inc. is an R&D firm specialized in agricultural lighting and automation, while Florentaise is a world leader in substrate innovation, manufacturing and distribution. As HRVST, we're transforming agriculture through technological innovation—and disrupting the agricultural world of today for a better tomorrow.

Cross-disciplinary engineering



Robotics



Mechanical



HVAC



Agronomic



Software



Electrical

OUR TECHNOLOGY

Who knows what the future holds?

We do.

The future is a planet that is nourished, even when traditional agriculture is stretched to the limit.

The future is high-yield harvests where fertile soil is at a premium.

The future is urban farmers who use real-time data to optimize their methods.

The future is HRVST hyper-controlled vertical farming technology.

Turnkey multilevel hyper-controlled growing facility

HRVST's hyper-controlled turnkey technology is the most powerful, versatile industrial vertical farming solution on the market. Unlike other urban farming systems, ours can process and independently optimize several different crop types at once.

Features

- Fully customizable intelligent modular framework
- Photosynthetically optimized water-cooled LED lighting
- Automated irrigation and fertilization
- Energy-efficient, year-round climate control
- Automated CO₂ and humidity injector
- Row-by-row airflow control system
- Automated row cleaner
- Advanced operation, planning and task management interfaces
- Comprehensive online database

Applications

Agro-industrial

- Steady supply
- Superior quality
- Consistent pricing

Urban farms

- Lower transportation costs and duration
- Flexible scaling
- Grow, manage and substitute an unlimited variety of plants to meet market demand

Farming coops

- Withstand climate change
- Stabilize production year-round
- Supplement traditional farming



The global vertical farming market was valued at USD 2,23 billion in 2018, and is projected to reach USD 12,77 billion by 2026.



Up to 95%
in water savings.



Control operating
temperature, relative
humidity and night/day
cycling for year-round
harvesting—even in dense,
urban environments.



Heat generated from the
LED lights is used by the
climate control so that
no energy is lost or misused.

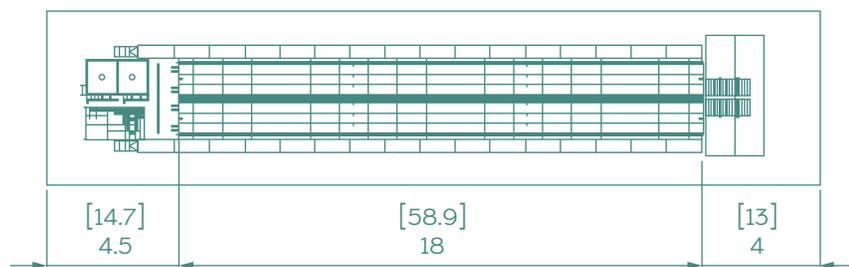
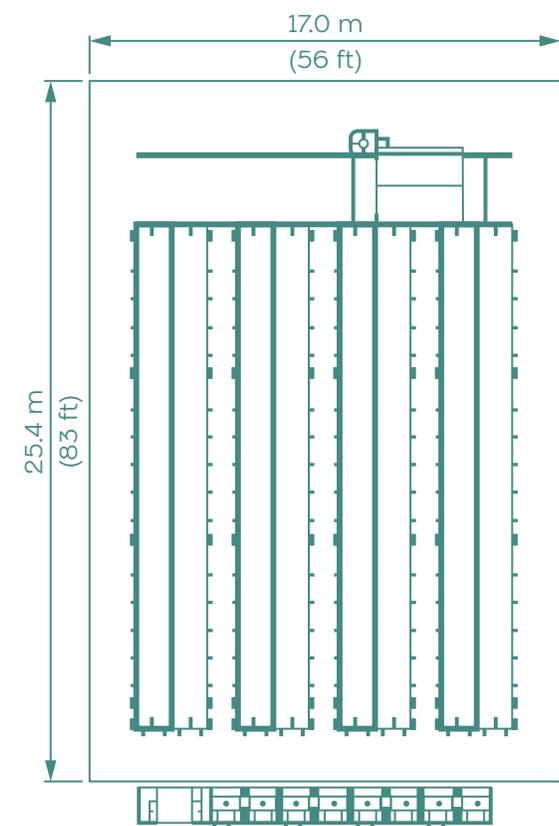


HRVST technology yields
55 times more produce per
unit of area compared to
conventional farming.



OUR PRODUCT

The HRVST Vertical Farm is available in two different sizes



FULL SIZE

- Length:**
18 m (60ft)
- Height:**
8 m (26ft)
- Number of levels:**
10
- Number of individual rows:**
80
- Harvesting space per row:**
21.8 m² (236ft²)
- Total harvesting space:**
1750 m² (18 836ft²)

MICRO

- Length:**
18 m (60ft)
- Height:**
3.5 m (11.5ft)
- Number of levels:**
5
- Number of individual rows:**
9
- Harvesting space per row:**
21.8 m² (236ft²)
- Total harvesting space:**
196.2 m² (2 124ft²)



Growing structure

HRVST's intelligent modular structure is designed to sustain the crop's full operational weight with integrated irrigation and gas systems. Each unit is fully customizable (length and height).



Lighting

Built on 10 years of research, HRVST's photosynthetically optimized water-cooled LED lighting device maximizes flower and fruit production thanks to a proprietary light mixture known for its unparalleled agronomical performance. Not only has the device been validated through rigorous testing by multiple industry experts—including internationally recognized Florentaise—it is continually being improved to stay at the cutting edge of hyper-controlled environment technology.

Light spectrum: Deep-Red, Infra-Red, Blue, White and UV.

Power consumption: 232 W/m² (22 W/ft²)

Equivalence in HPS: 546 W/m² (51 W/ft²)

Features: water-cooled, thermal protection, customizable light mixture at all times (optional).

Automatic irrigation and fertilization

The intelligent automatic hydroponic tide irrigation system can manage various plants at various growth stages, individually row by row. Continuous purification of irrigation solution allows for control of living organisms.

Features:

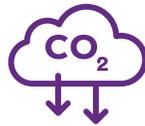
- **Automatic control of fertilization:** PH level, fertilizer type and concentration (up to 4 different fertilizers), injection of living organisms and oxygenation.
- **Dual filtration:** particle filter and UV filter.
- Water is recycled through the irrigation process to optimize its usage.





Climate control

Eco-energetic climate control system capable of generating cooling, heating and humidity control. Maintains the desired climate all year long. Global operating temperature (controlled) can be set from 15°C to 25°C according to a day-and-night cycle. Global relative humidity (controlled) can be set from 45% up to 75%. Heat generated from the LED lights is used by the climate control so that no energy is lost or misused.



Co2 and humidity injector

Uniformly distributed injector enables direct injection of CO₂ and humidity (mist) according to the need of the specified plant at all times. Automatic control of CO₂ injection for maintaining CO₂ level (global) or to create a CO₂ enriched period (local). Automatic humidity (mist) injection to create enriched humidity period (local).

- CO₂ control: 400ppm (outside air) to 2000ppm
- Humidity enrichment period: Up to 100%
- CO₂ expected consumption per hour: 1.6 L/m³ (0.045 L/ft³)
- CO₂ tank capacity allowing autonomy for monthly for operation



Direct irrigation injector

A direct liquid injector is installed on the main irrigation line to allow the possibility to inject living organisms. Possibility of controlling the injection quantity and sequence from the main interface.

WARNING: Agronomic and biological validation should be done prior to any living organism injection to avoid destabilization of the HRVST ecosystem and potential damage to the crop.



Airflow control

The system controls the airflow at the level of the crops independently for each row. Set airflow for day and night or for growth to flower between 0 to 0.5 m/s (20 in/s) on normal or burst mode. Airflow can also be automatically managed by the system to facilitate the creation of enriched periods of CO₂ or humidity.



Automated lifting platform

Perfectly custom designed to foster handling in the HRVST system, the platform is optimized to facilitate the seeds and clones transfer and crop harvesting processes. A pulley conveyor system is installed in each row to move the panel around when seeding and harvesting. American and European security regulations apply.



Oxygen injection

Automatic injection of oxygen into the irrigation solution is available to improve performance. Injectors are located inside the irrigation tank. Dosage and frequency of injection are controlled by the main interface. Can be used in parallel with oxygen peroxide.



Specialized crop carrier tray

HRVST Crops Carrying Trays are custom designed for the plant's needs and the growing medium used. Several options are available to allow optimal performance.

Florentaise is a partner company of HRVST and they are experts in providing raw materials for agricultural purposes. Depending on the needs of the plants and the desired irrigation strategy, HRVST can also supply natural customized containers and substrate.



Automatic row cleaner

Each module is equipped with an Automatic Row Cleaning device. These devices are installed on every row after a harvesting cycle and launched for automatic water jet cleaning. The cleaning solution is injected to ensure proper purification of the environment.



Control interface

Custom-made HRVST software includes a Linux based computing and control main software, an advanced intelligent display application and an online database. There are three types of control included with HRVST system:

- 1** The touch screen main interface is designed for the agronomist and other advanced operators.
- 2** An android base secondary interface for consultation and job planning is available on a portable tablet format. This interface is designed for agronomists and facility managers.
- 3** Directly fixed on the harvesting platform, is a job management interface conceived for the general operator.



SETUP AND SUPPORT

HRVST installation timeframe (months)

1	2	3
Manufacturing		
		Installation



4

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Fine Tuning and Technology Transfer		
Production		

Warranty

All HRVST solution components are covered by a minimum of two-year product warranty against defects. Certain components like lighting fixtures and electronic devices are guaranteed for three years. The warranty coverage starts after the entire system installation is completed. For more details, please see HRVST Limited Warranty Disclaimer.

Training

HRVST will provide full initial system training to client’s operating personnel and assist with the first 90 days of production. Operation manuals will also be supplied to each trained employee as a reference guide. Details regarding the training program will be provided in the Training and Technology Transfer guide.



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