

Harvest Today develops an innovative indoor growing solution using Xylem Rule technology

The Harvest Wall utilizes a technology-based approach to increase food production and security for communities globally

The scale of the current global hunger and malnutrition crisis is worsening, with over 345 million people worldwide currently facing high levels of food insecurity - more than double the number in 2020. However, indoor horticulture is growing in popularity as a modern solution to many environmental problems that affect food production and food insecurity.

By controlling humidity, light, carbon dioxide levels, temperature, and nutrient levels, farmers can protect crops from moderate to extremely bad environments and grow fresh produce in a controlled environment to optimize yield production. In support of this mission, agri-tech company Harvest Today, has designed a simple yet highly engineered solution to indoor growing, empowering communities to grow their food locally and harvest crops right off the stem.

Challenge

The Harvest Wall is a scalable indoor vertical grow wall that maximizes food production by allowing local communities to produce all-year-round crops organically. As a self-contained irrigation system, the solution uses 97% less water through its patented Vertigation™ technology. Designed with flexibility in mind, the system is available in more than 105 sizes to meet multiple application specifications, and has the capacity to grow up to 720 plants in only 16 square feet of space.



Harvest walls can be built to scale using individual panels or tiles containing six grow ports. Through Harvest Today's unique Vertigation channels, the system continuously runs a solution of water and nutrients over the exposed roots of the crops within the wall.

As a modular system, Harvest Walls can be built to the desired scale using individual panels or tiles containing six grow ports that are two inches in diameter. The system works by constantly flowing a mix of water and nutrients over the exposed roots of the crops contained within each panel or tile via the patented Vertigation channels. A nutrient reservoir situated at the base of each grow wall holds a pump that circulates this mixture up the inside wall of the units, then along the top, to then irrigate the roots before returning it back to the reservoir.

To support the system, Harvest Today required a simple, reliable and compact pumping solution that could support the consistent flow and recirculation of water over the potted plants, allowing them to thrive in a controlled environment. The pumps had to be powerful enough to support the irrigation of up to 720 plants at a time, yet small enough to fit within the system's compact and modular design.

When designing the system, Harvest Today struggled to find an adequate pumping solution that met the required specifications, having previously encountered difficulties with low AC voltage motor pumps.

Solution

Harvest Today then called on global water technology leader, Xylem, to find the right pump for the job. Working closely with a team of product engineers, Harvest Today tested multiple pump configurations before selecting two bilge pumps from Xylem's renowned Rule brand. Key considerations for the team in terms of pump selection was reliability, durability and simplicity, and the high pumping performance of Xylem's robust Rule Standard Bilge Pumps ticked all the boxes. Two different pumps, the 500 GPH (1,890 LPH) and 800 GPH (3,028 LPH) models, were selected to accommodate the scalable range of Harvest Walls offered by Harvest Today.

Xylem's Rule Standard Bilge Pumps are tested to the highest standard and are capable of achieving a superior pumping performance at just 24 volts, resulting in high flow rates with better efficiency. The pump's compact, efficient and long-life motors also have the ability to run dry for short periods, making it the perfect solution for the grow walls which circulate water three times a day, one minute at a time.

For Harvest Today, it was also important that flow rates within the system could be adjusted at any given time. Internally, the electronics within the Harvest Wall use pulse width modulation (PWM) to control the system, and the flexibility of the Rule bilge pumps allowed for the flow rate to be easily modified by adjusting the speed of the motor.

Result

"Xylem's Rule bilge pumps are integral to the design of the Harvest Wall," said Rick Langille, CEO & Founder of Harvest Today. "Thanks to Xylem's team of specialist engineers, we were able to identify a solution that satisfied specific flow



Xylem's Rule bilge pumps provide a steady flow to support the recirculation of water and nutrients within the system. The flexibility of the pumps allow for the flow rate to be easily modified by adjusting the speed of the motor.

rate and head requirements. Once we met the team, it was like the stars aligned. It's a solid engineered solution, and we couldn't be happier with how it turned out. The transparency and support that we got from the team was excellent."

"The Harvest Wall is such a unique solution, and we're incredibly proud to have supported Harvest Today in the development of a system that supports sustainable food production and promotes increased food security," said Rodolfo Aguirre, Regional Sales Manager - Jabsco, Flojet, Rule. "Rick was already familiar with our Rule marine solutions, and it's a testament to the durability of our products that he trusted us to provide a pumping solution to support this innovative application."

Constructed of ABS thermoplastic and PVC, of which up to 20% is recycled, the system meets stringent food safe requirements and doesn't require the use of chemicals or pesticides. With agricultural runoff now a major environmental issue, the Harvest Wall provides a sustainable and environmentally friendly alternative to traditional crop farming. The system can be used in residential settings, commercial settings, and everything in between.

Harvest Walls are now available globally, with dedicated Harvest Today distributors located in Africa, Australia, Europe, UAE, South America, the Caribbean and Canada.