

## RESULT 2: OPEN PLATFORM FOR SHARING KNOWLEDGE

### WP 1: Learning Environment for SMEs

## CASE STUDIES DEVELOPMENT

### APPLICATION OF VERTICAL CROP PRODUCTION IN A CHARITY FARM

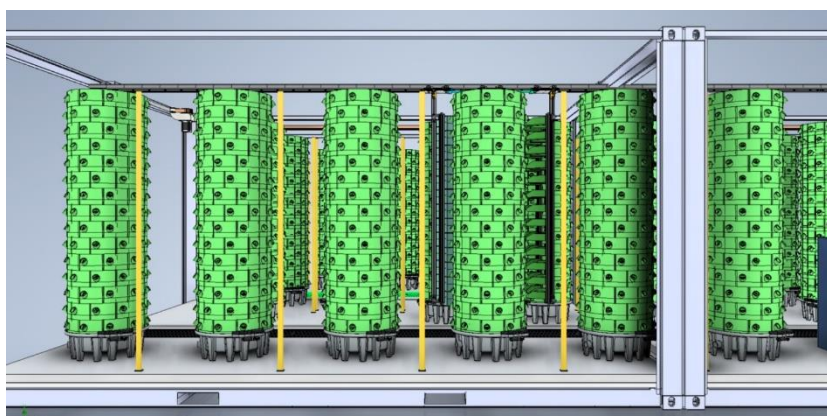
#### Part 1: General information for the enterprise

1. Name: Hungarian Baptist Aid
2. Location: Besenyőd, Hungary
3. Subject of activity: crop production
4. Legal status: registered priority charity („high public benefit“ NGO)
5. Management
  - a. Gender: Male / **Female** / Other
  - b. Age: up to 35 / 36-45 / **46-55** / 56-65 / over 65
  - c. Education: primary / **secondary** / higher
6. Farm size
  - a. 12 vertical towers

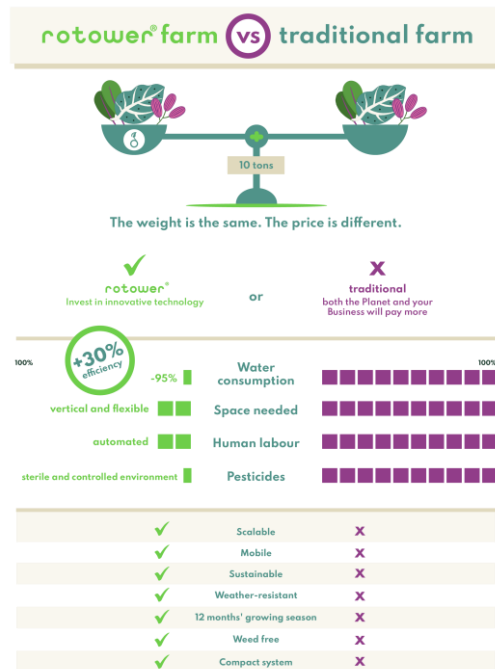
#### Part 2: Smart technologies used on the farm

*What smart technologies does the farm have? When and where are they applied? Is the accumulated data used and how?*

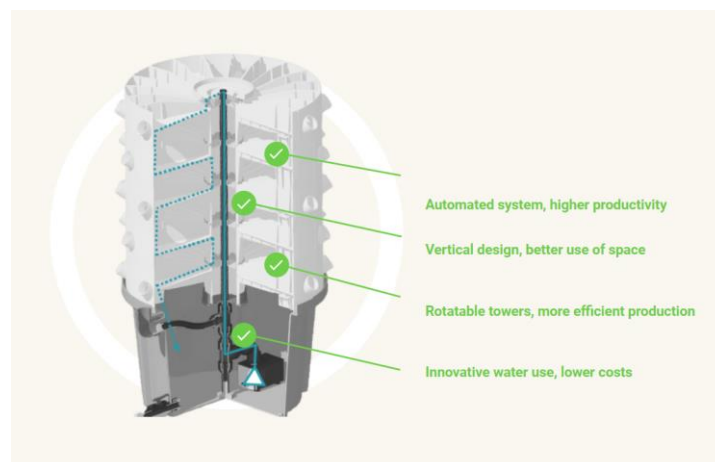
The Hungarian Baptist Aid, being committed to providing assistance to marginalized communities, recognized the need for food production in the region, particularly in the face of limited arable land. This led them to explore alternative solutions, and they discovered the Rotower hydroponic technology by Green Drops Farm. With the Rotower technology, they have established the "BapTower farm" in Besenyőd, where they grow healthy salads, herbs, and microgreens.



What makes this technology remarkable is that it allows to cultivate these crops in a pesticide-free environment while consuming significantly less water. On the 12 Rotower devices in Besenyőd, they can produce around 2000 plants, resulting in 4.5 tons of crop yield per year. And the best part is that this production is possible all year round.



The decision to invest in the Rotower technology was driven by the unique challenges they faced in Besenyőd. As Gergely Szanyi, Director of Development and Employment of the Hungarian Baptist Aid, told, Besenyőd is located in one of the poorest regions in Hungary, and the size and quality of arable land in the village were limited. This posed a significant obstacle to traditional agricultural practices for food production. The Rotower hydroponic technology by Green Drops Farm emerged as an ideal choice. Its vertical crop production system enabled us to maximize the use of limited space and grow crops in a controlled environment.



As Beatrix Matyók, farm manager said, they establish the "BapTower farm" in Besenyőd, which aligned perfectly with their commitment to provide nutritious and sustainable food options to the marginalized communities they serve. Furthermore, the technology's scalability and modularity played a crucial role in their decision-making process. The ability to expand the production capacity by adding multiple units made it a versatile solution that could adapt to the changing needs of our organization. The automatic rotation feature of the Rotower equipment reduces the number of LED panels required, making it an efficient and cost-effective solution.

*“Not only does this innovative technology provide us with a sustainable source of food, but it has also brought employment opportunities to those in need within the community.” – said Beatrix Matyók.*

The Rotower tower is designed to be scalable, which means multiple units can be placed next to each other. Each unit can produce 150 plants simultaneously, allowing for efficient and larger-scale production. Additionally, the technology provides a turnkey solution, encompassing lighting, air conditioning, air treatment, seedling modules, and mechanical engineering. It offers the flexibility to fully automate several phases of the production process, leading to increased productivity and yield.



The Rotower technology also allows for the automation of various parts of the production process, which is particularly advantageous when operating on an industrial scale. Green Drops Farm, the developers of the technology, are actively working on upgrading the online platform that enables remote checking and correction of the production process. By incorporating automated systems for monitoring and adjusting factors like air and water temperature, humidity, carbon dioxide levels, light intensity, EC, and pH values, the technology ensures ideal conditions for plant growth. The continuous monitoring with sensors and the ability to receive error messages and make adjustments remotely make the process more efficient and effective.

*“The implementation of the Rotower technology allows us to grow healthier, tastier, and greener crops in a pesticide-free environment. The precise control of environmental factors, such as lighting and water usage, ensures optimal growth conditions. The result is higher-quality produce that is not only nutritious but also environmentally friendly.” – said Beatrix Matyók.*

The accumulated data plays a crucial role in their operations. It is analyzed and utilized in multiple ways. First and foremost, it helps maintain precise control over the water supply and additional nutrition in it. By monitoring and analyzing the data, they can adjust parameters such as water flow and lighting to create the optimal growing conditions for the plants.

### Part 3: Owners' satisfaction with the use of smart technologies

#### 1. Utility assessment

*Is the farm manager satisfied with the smart technologies used? What benefits and advantages have they brought him?*

The feedback from Beatriy Matyók has been overwhelmingly positive. She has expressed great satisfaction with the advancements and the numerous benefits and advantages. First and foremost, the smart technologies integrated into the Rotower system significantly reduce the need for constant manual intervention. The automated features, such as the rotation of the equipment, precise environmental control, and remote monitoring capabilities, have streamlined the day-to-day operations of the farm. This automation not only saves time but also allows the farm manager to focus on other important tasks, such as crop planning, quality control, and optimizing production efficiency.



The continuous monitoring of vital parameters, such as air and water temperature, humidity, carbon dioxide levels, light intensity, EC, and pH values, through the use of sensors, provides real-time insights and data. This information enables the farm manager to make informed decisions, detect any deviations from optimal conditions promptly, and adjust them remotely as needed. This level of control and flexibility enhances the precision and productivity of the farm, ensuring optimal growth and crop quality.

*“Recently, following our invitation, the president of the Hungarian National Gastronomy Association paid a visit to our factory. He liked what he saw so much that negotiations began about bringing it*

*to his own restaurant, to Fenyves. We believe that such a well-developed system can provide a stable, reliable, continuous supply even for the restaurant network of an entire county. This is a great innovation of the 21st century. century, in which the Green Drops team tries to continuously develop, create new and even newer, in order to reduce the enormous pressure, put on our planet.”*  
– said Beatrix Matyók.

Furthermore, the smart technologies have improved the overall reliability and stability of the farm's operations. The ability to receive error messages and make remote adjustments means that potential issues can be identified and addressed promptly, minimizing the risk of crop loss or damage. This proactive approach to maintenance and problem-solving has been highly advantageous for the farm manager, allowing for smoother and more consistent production cycles.

## 2. Observed difficulties and problems

*What difficulties have they encountered or are encountering in using the new technologies? How did they learn to work with them? Do they have maintenance and consumables issues?*

One initial challenge was the learning process of understanding and operating the Rotower system effectively. As the technology is advanced and innovative, there was a learning curve for the farm manager to familiarize herself with the system's functionalities, controls, and processes. They worked closely with the experts from Green Drops Farm, the provider of the Rotower system.

Maintenance and consumables are also important considerations when working with any technology. Green Drops Farm is committed to ensuring the longevity and productivity of their Rotower product. Green Drops Farm provides maintenance, for key tasks like changing the water at regular intervals and cleaning the system. They also offer a 3-year warranty on the equipment.

In terms of consumables, the Rotower system utilizes specific components such as LED panels, sensors, and seedlings. These consumables may require periodic replacements or replenishment which comes at a price.

*“Our biggest challenge at the moment is that it is very difficult to involve the local community in the production, as the BapTower room is quite small, and people would need a minimum knowledge of how the system works. When we are working on the crop field it is easier to involve children and parents from the local community.”* – said Mrs. Matyók.

## 3. Potential risks

*Are they worried about issues such as post-warranty service, integration with next-generation technology, and being tied to a specific supplier or brand?*

Regarding post-warranty service, while the Rotower system comes with a 3-year warranty on the equipment manufactured by Green Drops Farm, there is a recognizable need for reliable support beyond the warranty period. It is crucial to ensure ongoing maintenance and service to guarantee the continued performance and longevity of the system.

Since the technology is fresh, Mrs. Matyók is not worried about being tied to a specific supplier, especially considering the non-profit character of their organization, which means that they are not under the pressure to compete within the market. For their social commitment this innovation is more than enough.

#### Part 4: Financing the investment in smart technologies

*How is the purchase of the new technologies financially secured - own funds, bank loan, financing under a particular program? Do they think that the prices of these technologies are beyond the means of most farmers? Do they feel that the decision to purchase their devices was astute and effective?*

The Hungarian Baptist Aid employed a combination of approaches. They primarily utilized their own funds, supported by donations from individuals, organizations, and corporate partners who share our vision and support our humanitarian efforts. These internal funds allowed them to make the initial investment in the Rotower devices..

*“The decision to invest in the Rotower devices was based on the specific needs of the community in Besenyőd, that is nutritious and healthy food accessible every day. While the initial costs may have been significant, we believe that with the long-term benefits, such as year-round crop production, increased efficiency, and sustainable farming practices, we will be able to provide more food for families in need.” – said Mrs. Matyók.*

Looking back, Mrs. Matyók believes that the decision to invest in the Rotower devices was astute and effective. The benefits we have observed, including increased crop yield, minimized water consumption, pesticide-free cultivation, and job creation for the marginalized community, have validated our choice. The Rotower system has proven to be a valuable asset in achieving their mission of providing sustainable and nutritious food options to those in need.

#### Part 5: Future intentions towards smart technologies

*Do they intend to continue using new technologies? Do they plan to purchase new types, and if so, what kinds? What are their intentions with the devices they own - do they plan to replace them with more recent generations as they become available?*

Gergely Szanyi, Director of Development and Employment of the Hungarian Baptist Aid, has told us, that there are several types of technologies that they are considering for potential purchase. These may include advancements in more energy-efficient lighting solutions, automation, and a more advanced digital monitoring system.

#### Part 6: Some photos



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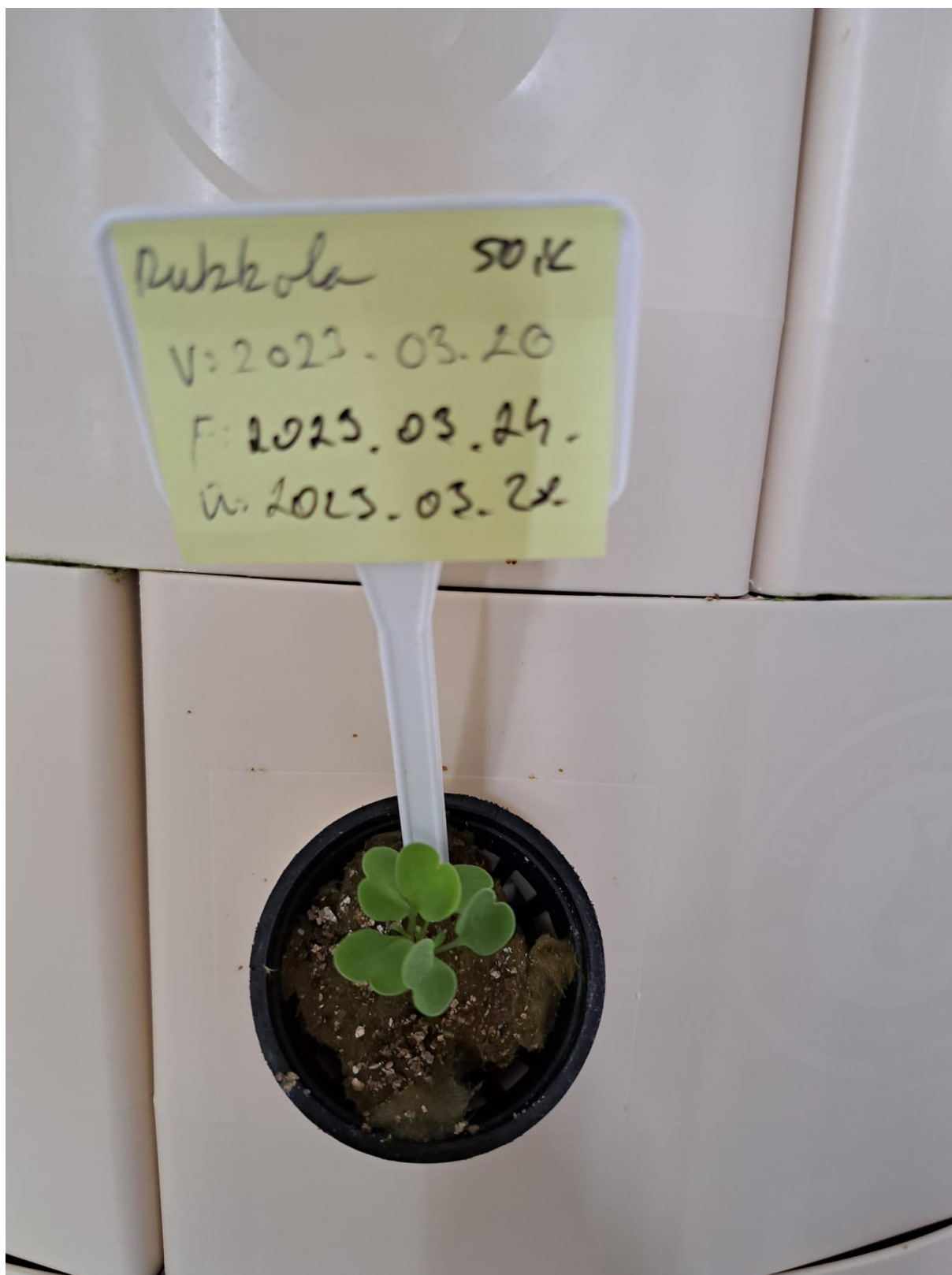


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