

Veve: Transforming Home Gardening with Vertical Hydroponic Technology



Name of the Organisations Involved

• RaisingPlus Innovations s.r.l., Italy

Challenges Identified

What was your motivation to implement digital technologies? What challenges or difficulties or other factors have you had that influenced your decision to implement digital technology in your farming?

The NASA hydroponic technology developed for space station chosen presented some difficulties in the integration in the chosen system.

One challenge experienced was the overlapping of the atomizer jets: this created an undercurrent in which the water particles collided and was not able to reach the vegetables in the optimum way. The jets had to be calibrated in the correct way so as to work as planned.

Additionally, they had to find the water pump that could lift the water at the requested height and within the chosen tube diameter.

However, challenges significantly stimulate creativity.

Goals and solution

The initial idea was: "with all the technology available, is there a way to bring a vegetable garden into the house to give vegetables according to everyone's tastes and without producing waste?" (cit. Matteo Sansoni)

The important concept was to reduce space, given that the focus was to cultivate at home. Therefore, the idea developed into "going vertical".

After long research, the solution chosen was NASA hydroponic technology that was developed for the space station to cultivate in less space and without the use of soil. This technology has been studied and applied first to a prototype and then to the actual product development.

Actions taken

Veve is a vertical garden that only occupies 1 m2 instead of 20 m2. No soil is needed to make it work, just water enriched with nutrients that is sprayed on the roots. In this way roots absorb biological (no chemical) nutrients and oxygen more easily. Plants develop better and easier and faster: the company confirmed that

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plants grow at double the pace (given the same time, a plant on soil grows 5cm, one on Veve grows 10cm. This reduces development times and Increases production.

The vertical garden is structured as such:

- Water level control,
- Nutrients in proportion to the water (with probes that verify the concentration) = liquid or powder to
 add to the water, fermented vegetable macerates which all contain macro- and micro-nutrients
 suitable for the plant,
- Expanded polypropylene panels (polystyrene type) suitable for food, they support the vegetables with special alveoli + basin for water + pump pushes water every 15 minutes onto sprayers.
- It functions with electric energy.



Skills and Training:

"We growth through mistakes, in the typical learning by doing process". Therefore, the company studied and researched until they reached the final product.

The only part of the process that they admit was more lacking was the economic-financial one. They received support on this from the <u>Progetto Manifattura incubator</u>, which supported their idea and helped them for the economic part and in particular in the definition of the business plan, therefore helping them moving from idea to the practice.

The subsequent steps foreseen are a 60x60x220 internal system in the form of a kitchen appliance. Or the adding of a LED system and a cover for external structure to make it usable even in winter time.

Benefits and Impact

- Greater yield,
- Fewer work difficulties: it is suitable for everyone, elderly or children for rest homes and schools,
- Self-production of vegetables allows people to cultivate according to their tastes and in a healthy way,

Home garden: no need to move around and this reduces processing time.

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