

## Malta

# Farm's performance, restructuring & modernisation

### Location

Ix-Xgħajra

### Programming period

2014 – 2020

### Priority

P2 – Competitiveness

### Measure

M06 – Farm & business development

### Funding

Total budget 140 000 (EUR)

EAFRD 52 500 (EUR)

National/ regional 17 500 (EUR)

Private 70 000 (EUR)

### Project duration

2019 – 2022

### Project promoter

Pierre Axiaq / Clyde Zammit

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### Website

[www.tal-kampanjol.mt](http://www.tal-kampanjol.mt)

## CAP funds invest in innovative Maltese aquaponics and vertical farming greenhouse

### Summary

A group of engineering graduates designed and implemented a highly innovative project in the central area of the Island of Malta (Haż-Żebbuġ). It consisted of setting up and equipping a hi-tech hydroponic greenhouse which integrates other organic practices from aquaculture, Korean Natural Farming, Regenerative Agriculture and the



© Axiaq farm

Integrated Aqua-Vegeticulture System (IAVS) method for producing vegetables and fish. The innovative combination of these production methods saves energy, water, fertiliser, and labour.

### Project Results

The greenhouse can produce approximately 1 tonne per week of vegetables and 4 tonnes per year of fish, using waste products as inputs (fertilizers, food etc.).

Rainwater provides for almost 90% of the greenhouse's needs and water is prevented from percolating nitrates and sulphates into the water table.

Vertical space techniques increase the number of crops per m<sup>2</sup> and reduce use of synthetic nutrients by 95%.

Some 98% of the farm's energy needs are met with renewables.

### Lessons & Recommendations

- ❑ Project efficiency can be improved by investing time in advance to understand legal requirements and funding systems

## Context

Pierre Axiaq is a young engineer with a background in agriculture. Along with two of his colleagues he set out to test the feasibility of running a 'semi-closed farming' system in a hot climate. The group was motivated to prove that indoors, environmentally friendly farming practices - those which save and/or reuse natural resources - can be profitable in the Maltese context. They used CAP funds to set up a pilot farm on 0,23 hectares of land to test their theory.

## Objectives

The aim of the project was to present a cost-effective replicable solution (hydroponic agriculture) that tackles the sustainability problems associated with conventional farming practices in Malta. The project will help to change perceptions amongst farmers by demonstrating a new farming model that exploits environmentally friendly practices and technologies.

The project technology aimed to demonstrate that waste products could be used as inputs (fertilisers, food etc.) thanks to the multitrophic polyculture production system. Vertical space techniques would increase the number of crops per m<sup>2</sup> - thus reducing the demand for land, which is a valuable resource in Malta. Synthetic herbicides and pesticides would be prevented from percolating nitrates and sulphates into the water table.

## Activities

The project consists of setting up and equipping a hi-tech hydroponic greenhouse combining organic practices from aquaculture, Korean Natural Farming, Regenerative Agriculture, and the Integrated Aqua-Vegeture System (IAVS) method for producing vegetables and fish, while minimising every resource used. CAP co-finance was used to:

- Prepare the land for the construction of a 240 m<sup>3</sup> capacity rainwater reservoir and lay the foundations for the greenhouse;

- Construct the greenhouse and install a wind-driven extractor fan and 10.5 kw/h-capacity solar panels on its roof in addition to energy storage equipment;
- Install the irrigation system, fogging and ventilation fans, shading equipment, and pure oxygen concentrators, alongside the software (open-source, using IoT and Modbus over TCP/IP) that allows remote monitoring and control;
- Install the hydroponic setup (using a mix of vertical farming, deep water rafts and silica quartz sand beds) and the Recirculating Aquaculture System (RAS);
- Integrate the hydroponic and the RAS systems;
- Start cultivating vegetables and producing fish (mainly tilapia and catfish which are able to adapt to warm water conditions); and
- Develop and launch the farm's web site.

## Main results

The hi-tech greenhouse can produce approximately 1 tonne per week of vegetables and 4 tonne per year of fish. The features of the high-tech greenhouse allow it to:

- Rely on rainwater for almost 90% of its needs.
- Reduce the use of synthetic nutrients by 95%.
- Contribute to climate change mitigation by meeting 98% of the farm's energy needs with renewables.

## Key lessons

Permits and funding applications should be planned adequately in advance and progressed in close cooperation with relevant authorities.

*"Implementing our original plan for setting up the farm proved more cumbersome than expected, but this was in part due to the sophisticated materials we chose."*

## Additional information

[www.facebook.com/TalkampanjolAquaponics Farm](https://www.facebook.com/TalkampanjolAquaponicsFarm)

[www.youtube.com/watch?v=5HmdCdaTH\\_M](https://www.youtube.com/watch?v=5HmdCdaTH_M)

[www.facebook.com/ClimateOnMalta/videos/1251544338674514/](https://www.facebook.com/ClimateOnMalta/videos/1251544338674514/)

[www.youtube.com/watch?v=cw8-bMat-ql](https://www.youtube.com/watch?v=cw8-bMat-ql)



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