

## Excerpt from the Vertical Farming Project Application (submitted 2018)

*Some details have changed due to delays in approval. The project will now run over 2.5 years starting in January 2020 and have 2 full time members of staff.*

### Overview of project plan

- Our proposal is to run the project for 3½ years. In other words to have 2 growing seasons, with project implementation in January 2020.
- We're proposing to purchase 5 micro hydroponics unit - 3 of the units based on a 'nutrient film technique' suited to grow speciality leaves and oriental produce, and 2 based on a 'flood and drain' system to cultivate microgreens. (See supporting document titled "Hydroponics Lowdown" for further information on the micro growing units.)
- We propose one unit to be housed at Glynllifon College for duration of project. The other 4 units will be offered to individuals/businesses interested in piloting hydroponic growing. We envisage an application process to identify the pilot growers, on the back of a public open call for new growers. These growers will be referred to as "Pioneering Growers." They will need to demonstrate interest, commitment and willingness to fully engage in the piloting process as part of the application process to participate.
- Each grower will be offered a pilot micro growing system from the project, free of charge for up to one calendar year. The grower will be responsible for purchasing all consumables including seed, nutrients, growing media and pH/ECmeters. The **'Pioneering Growers'** will only be offered the opportunity to participate upon agreeing to cover running costs and implement the growing schedule agreed beforehand.
- The aim of each pilot micro growing system is to allow new growers to experience hydroponic cultivation as part of a vertical farm system. There are no commercial vertical farmers in North West Wales. Menter Môn is persuaded that developing and supporting the establishment of vertical growers will fill the gap for local provision of fresh produce. Further facilitation and support is required to ensure that resilient and efficient supply chains are developed.
- 2 members of staff will be employed to work on the pilot project. A full-time **'Supply Chain Facilitator'** will be recruited to work for 3½ years with the main aim of facilitating the building of new supply chains for fresh produce with locally based partners operating in the chain. These partners will include distributors, retail outlets and restaurants. A **'Growers Animator'** will be employed 3 days a week equivalent to specifically support each cohort of growers during the project.
- The Supply Chain Facilitator will be responsible for bringing supply chain partners together to work on a plan and solutions to build a local supply chain for fresh produce. This group will be called the project's 'Taskforce' and will meet quarterly

during the project's lifetime. It will be facilitated with the aim of becoming self-sustaining post project. Growers will also be invited to participate in the Taskforce.

- The Taskforce will act as the project's steering group.
- The Grower's Animator will run and support a **Growers' Forum** which will be held 8 times a year to provide learning experiences for the growers participating. This forum will be open to growers involved in the project, with 2 of the events held open to all interested, and may include potential growers from other parts of Wales.
- The Growers' Forum will include activities such as study visits to other commercial hydroponic growing sites in the UK, workshops with specialists, hacks at each other's growing site, action learning sets and update sessions where growers can share experience and data from their growing unit. A session will be held at the beginning to encourage each Pioneering Grower to share their experiences on social media on platforms such as Facebook, Twitter and Instagram.
- At the end of year 1, the 4 Pioneering Growers will be offered support by the Facilitator to review and evaluate their growing experience. Growers who show interest in continuing will be offered additional support to signpost them to the relevant 'Business Wales' service to further their business ideas. They will be allowed to continue to participate in the Growers' Forum, as they will have useful experience to share with new growers in year 2 and year 3.
- Glynllifon have offered temporary storage of the units if required between cohorts of Pioneering Growers.
- The 4 pilot micro growing units will be offered to a new cohort of Pioneering Growers in year 2, and subsequently the same in year 3. A review will be conducted between year 1 and 2, and year 2 and 3 to identify improvements and learning outcomes.
- Over the course of the project, 12 businesses/individuals will have been given the opportunity to pilot the growing methods. And we estimate 60 students (20 per year) will have been actively involved in managing the Glynllifon pilot unit.
- Each growing unit will run off a standard electricity connection. The units identified for the project have been developed into a commercial product with support through the Innovate programme.
- Each growing unit measures approx 1.5m wide, 1m deep and 2.4m tall, and mounted on castor wheels. Each unit will have 4 or 5 growing layers connected to a frame. They are supplied by a company called HydroGarden, and we are yet to come across a similar alternative.
- Each of the 4 growers involved in piloting each year will be given the units for free, for duration of one growing season. The idea is to provide them with experience of growing hydroponically to learn. The unit we provide will not be commercially viable in terms of scale, but ideal in terms of learning and piloting. We expect half of those involved to go forward to continue growing via investing in setting up their own

system. By June 2022 we will be in a position to evaluate how many of the Growers have gone forward to grow commercially.

- A key part of the project will be support to develop local supply chains for potential new growers. From previous work, we are aware that the technology does work, and with no artificial heat input, will produce for 9-10 months of the year, which corresponds nicely with the tourist season in North West Wales. The real challenge is developing a cluster of confident growers, and developing smart, sustainable and efficient supply chains locally for the Pioneering Growers. We expect interest from farming families as well as non farming individuals, because having a parcel of land is not necessary for vertical farming.

- After year 1 is complete, a second group of growers will be recruited to pilot. We expect year 2 growers to benefit from the work done in year 1, and gain from the support of year 1 growers. We propose to replicate this in year 3 as well. By the end of the project, we are aiming to have 6 commercial vertical farmers in the area, supplying the market place with fresh produce. We state the establishment of 6 commercial growers by end of the project, on the basis that we expect some growers will not continue after piloting.

- Although supplying local restaurants is the obvious route to market, we are aware of other possibilities such as online sales.

- The idea of this model came from observing how the buoyant micro-brewery scene has developed in our area. There are 4 micro-breweries who have set up in Gwynedd/Conwy using the exactly same basic equipment! After the first one finished with it, they passed it on to the next and so forth. It gave each of them the opportunity to trial and pilot different brews, to learn and make mistakes quickly and cheaply, and to test their market before deciding to invest further in a small scale commercial brewery. We think that this approach could be applied to support the kick-start of small-scale commercial growers of fresh produce in North West Wales.

- We have been told that each pilot unit, if we bought from HydroGarden would cost £5,400+VAT.

- We propose that the ownership of each of the 5 units would remain with Menter Mon for duration of the project.

- After 3 years of use, we expect that the units will have some residual value, although it's unclear exactly how much as it's a specialist product and quite new to the market place. The plan is to transfer ownership of all 5 units at the end of the project to Glynllifon College to continue to use as learning resources for their students. There are many examples across the UK of colleges and universities who have bought these units for educational and researching purposes, so we feel it could offer a useful learning resource for the College to carry on with the work to nurture interest and skills in hydroponic cultivation in the area.

- 6 months have been allocated at the end of the project to conduct a thorough evaluation and review of the pilot, with the aim of publishing a report with clear

outcomes and learning points. Time will be allocated to promote and circulate this report.

**\*\*\*See file “Hydroponics Lowdown” (supporting document) for further information on the growing technology that will be applied and why it offers a solution to developing local supply chains for fresh produce.**

## **Delivery details and timetable**

*“Developing supply chains through facilitation.”*

The project aims to start in January 2019 with recruitment of 2 members of staff, one will be a full time Supply Chain Facilitator and the other will be 3 days a week Cluster Facilitator who will provide technical support and mentoring to growers. These staff can then be preparing material for training and information, developing a supply chain development plan and building relationships with potential buyers whilst a recruitment drive is under way for growers.

The project aims to work with young people (under 40 years of age) offering them opportunities to use space on their family farms or in rented buildings if they are not currently involved in agriculture. At least half the of the pilot micro growing units will be allocated for young people.

Pioneering Growers will be recruited via local papers, social media, college contacts....There has been considerable interest already in the project, so we expect a good number of applicants.

Selection of the four first year growers will be made following interviews with candidates in time for an April 2019 start of the growing season.

The hydroponic technology will be purchased from HydroGarden, a company that has the most appropriate equipment of a very high specification and build quality. This has been selected following research by Menter Môn into products available and recommendations from current practitioners personally and online.

Two types of vertical farming system will be purchased to give the opportunity for comparison.

- The VF 5207 is a small Nutrient Film Technique (NFT) system where a very shallow stream of water containing all the dissolved nutrients required for plant growth is re-circulated past the bare roots of plants in a watertight gully or channel.
- The system measures 1503mm long by 880mm wide by 2400mm high. There is 3.52m<sup>2</sup> of growing area per rack, enough space for 132 plants.
- The unit has LED lights which can be set on a timer and a pump to propel the plant nutrients through the apparatus.
- The VF5222 is a very newly developed system which works on the Flood and Drain principle. The plants are not in individual positions, so this apparatus is designed for growing salad leaves or micro greens. It has 5 trays giving 4.6m<sup>2</sup> of growing area per rack.

- This system measures 1260mm long by 860mm wide by 2400mm high.
- The unit has 20 LED lights as well as a pump and timer.

These units will be installed in grower's buildings and in Coleg Glynllifon by the end of April 2019. It is anticipated that they will produce crops for 9-10 months without artificial light or heat. The running costs and purchase of consumables for use in the units will be covered by growers.

The **Taskforce**, which will include partners from all part of the supply chain, including growers, processors, wholesalers, retailers and restaurateurs will be established in the spring of 2019 to work with the project, support supply chain development and enable growing expertise.

Instruction and assistance will be given to all growers by the Animator, who will also be organising regular monthly meetings, visits to commercial UK growers and other educational visits. The Supply Chain Facilitator will work with growers and existing and potential users and distributors of the produce to establish viable local markets. New initiatives such as Food Assemblies will be researched as a way of minimising the length of the supply chain.

Coleg Glynllifon will be similarly supported, students on courses in the college will be given responsibility for the unit and encouraged to develop their skills and innovate. The college will be a venue for meetings and demonstrations for the project.

Local organisations including Farming Connect, Cywain, Tyfu Cymru and the farming unions will be engaged with to make best use of their expertise and contacts.

A contractor will be appointed to evaluate the project and assess its social, cultural and financial impact. Continuous and cumulative evaluation will be carried out both by the contractor and the project team via interviews, meetings and assessment of the social media feedback from the project.

The first growing year will be assessed in November 2019 and any adjustments identified will be made before the next growing season.

At the end of the first growing season those growers who wish to continue to produce crops will be helped to find funding for scaling up production with their own vertical farming units and given support and advice on running a viable, sustainable business by the project officers. They will be encouraged to work with the next group of growers to share their lessons learned throughout the year.

It is expected that at least 50% of growers will want to set up their own growing businesses.

The units will be prepared for passing on to a new group of growers recruited locally as before.

Pilot work, awareness raising and dissemination will be carried out by the project team as before.

At the end of the second year this process and the assessments and adjustments will be repeated.

Following the third growing season there will be a 6 month period of evaluation of the project overall and a report will be produced with recommendations and a summary of information learned through the project.