

New Technology from DIT



A High Density Cassette System for Intensive Aquaculture

AquaFarm is a novel modular recirculating aquaculture system (RAS) that enables low cost farming of aquatic species in high density. The system is an above ground, modular shelving system where tanks are stacked and easily accessed with each sliding out as required.

RASs are self-contained aquaculture systems that require minimal water

exchange due to the internal recycling of water using both biological and mechanical filters. RASs overcome the constraints imposed by temperate climates and other environmental factors by providing a controlled, predictable and bio-secure environment for the culture species.

AquaFarm offers a lower cost and more ergonomically efficient RAS than existing commercially available systems. This type of system provides a flat pack alternative for farmers and food producers who wish to develop an aquaculture business of any scale. It can deliver a scalable modular model to the agri-

food market that will allow existing aquaculturalists to diversify at a lower cost. It will also enable farmers and other food producers to diversify into marine aquaculture on a small scale.

Novel aspects of the system include its portable self-cleaning tanks, modular framework, recirculation system and primary solids filtration system. Secondary fine solids filtration, aeration, pH control, water monitoring, data logging and alarm messaging systems are included within the primary solids filtration system.

Applications

AquaFarm has been optimised for the rearing of shellfish but can easily be adapted to suit other marine species including fin fish.

The technology provides a production system in which fin or shell fish can be specially reared year-round in order to meet increasing market demand.

The flat pack modular nature of the system allows the cassette modules to be added to or taken away depending on market conditions.

Opportunity

Ireland is one of the best placed countries in the world to develop aquaculture to meet the demands of a growing EU market through land-based RASs.

The EU seafood market is valued at approximately €55 billion with almost 70% of all seafood consumption being imported. Europe imports nine million tonnes of seafood per annum, twice as much as Japan or the US. (*Bord Iascaigh Mhara, 2012*)

Significant emphasis is being placed on the agri-food sector by Bord Iascaigh Mhara in Ireland and the Department of Agriculture and Rural Development in Northern Ireland to develop further aquaculture activities.

Existing RASs have many limitations and are expensive to deploy and operate due to their large spatial requirements, poor ergonomics, labour intensive cleaning and expensive ancillary engineering requirements such as sumps, piping and reservoirs.

AquaFarm, on-the-other-hand, is modular and scalable, cost efficient to build and can be adapted to suit any size of capital requirement. It can produce multiple types of marine species cost effectively.

Advantages

AquaFarm is more advantageous than existing RASs due to a number of unique features:

- **Multi-Species Farming** – enables greater numbers of different species to be framed within a single location.
- **High Volume Production** – the technology allows for high density production, enabling greater efficiency and revenues.
- **Lower Maintenance** – reduced cleaning requirements due to novel tank design.
- **Affordability** – enables marine farming on a small scale and affordable basis.
- **Optimisation** – can be optimised to meet the specific environmental requirements of various aquatic species.
- **Diversification and Profitability** – this type of system can provide a flat-pack alternative for farmers and food producers who wish to diversify into shell fish and fin fish rearing on a small scale basis, adding to the gross margin of the total farm enterprise.

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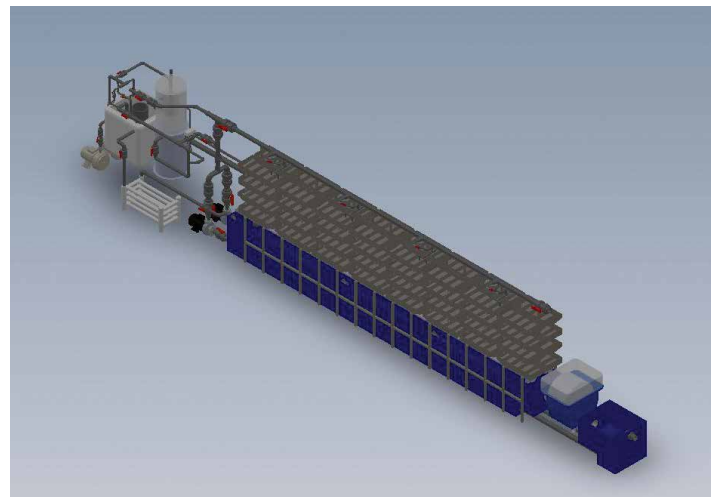
Stage of Development

AquaFarm was developed in the School of Mechanical & Design Engineering at Dublin Institute of Technology (DIT).

DIT Hothouse is currently seeking expressions of interest from companies interested in licensing and developing the product.

A full scale RAS model has been developed, schematics designed and the product concept has been proven and demonstrated.

Further development work by a licensee will likely be required on product development, engineering and commercial scale production. Branding, distribution partners and routes to market are other considerations.



Above: Illustration of the AquaFarm prototype

DIT Hothouse Technology Transfer Office

Dublin Institute of Technology,
Aungier St, Dublin 2
+353 1 402 7179 hothouse@dit.ie
www.dit.ie/hothouse