

TECH OFFER

Temperature Regulated and Modular Rooftop Greenhouse Farming



KEY INFORMATION

TECHNOLOGY CATEGORY:

Life Sciences - Agriculture & Aquaculture
Sustainability - Food Security

TECHNOLOGY READINESS LEVEL (TRL): **TRL7**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174386**

OVERVIEW

Singapore is currently only producing 13% of its vegetable consumption. With little farming land available, Singapore relies heavily on imports from other countries. Due to increasing focus on food security, the alternative to solve land scarcity problem is to build greenhouses on concrete rooftop. Although concrete rooftop greenhouse are able to keep pests out, there is a significant heating problem which severely inhibits the growth of the vegetables. Therefore, there is a need for a rooftop greenhouse that is able to actively cool itself to avoid such problem.

This technology offer is a modular rooftop greenhouse farming system (hydroponics) capable of producing vegetables on concrete roofs to meet the local demand while reducing over-reliance on imports. The design of the greenhouse farming system enables cooling and does not heat up, thus allowing the growth of pest-free vegetables. The system is approximately the size of a typical carpark lot (2.5 x 5 m). The production rate is 30 kg per month (2.5 x 5 m size) and requires minimal human intervention. The technology offer comprises both the farming system and its operation know-how. The modular rooftop greenhouse farming system can be set-up within 3 days or scaled-up when required with guaranteed vegetable growth. The

break-even cost of one greenhouse is about 3 years.

The technology owner is seeking to out-license their technology.

TECHNOLOGY FEATURES & SPECIFICATIONS

This technology offer is a temperature regulated and modular farming system (hydroponics) for rooftop farming. The features and specifications are as follows:

- Modular and scalable
- Flexible sizes (as small as 2.5 x 5 m)
- 30 kg/month (2.5 x 5 m size)
- Active cooling design (20% reduction in temperature)
- Passive system operation (minimal manpower)
- Anti-pest
- Quick setup (3 days)
- Applicable for wide range of crops

POTENTIAL APPLICATIONS

The main application for this technology is for those that are interested in rooftop farming. The potential applications are:

- Conversion of barren and unused concrete space into temporary/permanent arable land (eg. Carpark rooftops, schools, apartments, factories and floating platforms etc.)
- Can be applied to high-value crops

UNIQUE VALUE PROPOSITION

- Minimal human intervention is needed as the modular greenhouse farming system encompasses Internet of Thing (IoT) and automation
- Ability to scale-up immediately