## New Agriculture

# Film Farming



### Imec - film farming - offers a sustainable agriculture

#### What is imec (film farming)?

Imec (film farming) is the world's first agricultural technology developed to cope with the serious issues that the world is facing today, such as stable food supply and quality assurance, water shortage, soil degradation and pollution.

Imec is a technology to cultivate plants on a special film called hydrogel membrane placed over the nutrient solution.

This film has countless nano-sized holes blocking bacteria and virus in order to drastically reduce the use of pesticides and produce safe crops even though the nutrient solution gets contaminated. Imec also eliminates loss of water and fertilizer.

Due to the nature of the hydrogel that the nutrient solution absorbed in the film does not come outside even if squeezed out, the crop produces an enormous amount of capillary roots to ingest the nutrient solution in the film. It achieves high nutritional values such as high sugar content by efficiently absorbing water and fertilizer.

Imec is an absolutely new farming technology to maximize the performance that the crop originally possesses.



🌯 Water / Nutrient 🛛 🗮 Pest/Bacteria 🛛 🗙 Intercept/Block



Plants growing on the imec film

A Plant roots covering the film surface

Many capillary roots when magnified Capillary root cells

Plant capillary roots sticking to the film



Dr. Yuichi Mori, CEO, holding the imec film with the plants attached

Technology protected by patent Imec's patent is filed in more than 134 countries, and already registered in over 110 countries.



#### Development history of imec and its future

Imec is a technology invented by Dr. Yuichi Mori, CEO of Mebiol Inc. (ex-visiting professor of Waseda University) who has been developing membranes and hydrogel technologies used for medical equipments such as dialysis membranes, artificial blood vessels and catheters for over 30 years.

Dr. Mori established Mebiol in 1995 to apply advanced polymer technologies cultivated in the medical field to the agricultural field and cope with the stable food supply and safety issues disturbed by water shortage, soil degradation and contamination occurring in every corner of the world due to the global warming.

Imec was introduced for the first time in Japan in tomato production in 2008. The diffusion area now has reached over 100,000 tsubo (approx. 330,000 m2) and is still expanding. Besides tomato, the production of fruit and vegetable such as cucumber, melon, strawberry and paprika is under study.

Taking advantage of the characteristic of imec that can produce high-quality crops even barren areas without agriculture, people are starting to produce high-quality tomatoes in the devastated areas by Tsunami in Japan, in the suburbs of Shanghai where the soil contamination is concerned, and in the Dubai desert areas. In addition, we are planning to introduce the imec tomato production to Saudi Arabia, Russia and U.S.A.

We are also developing a new plant factory technology aimed at cultivating leaf vegetables like lettuce using imec film.

#### **Visualization of roots**



Tomatoes under cultivation and many capillary roots attached to the imec film (right)

In recent years, "the visualization of the cultivation environment" has become more and more common for the purpose of improving the crop yield and quality.

It is a method of grasping as numerical values by monitoring the cultivation management process based on the past intuitions and experiences with the object of the management improvement and manualization.

Imec "makes visible" the conditions of roots that could not be seen by the conventional agricultural technologies.

With imec, a very large number of capillary roots grow. Capillary roots are highly important organs for plants and affect the health conditions of crops, that is the yield and quality.

The visualization of the amount and color of roots and the amount of absorption of water and nutrients is effective in grasping and diagnosing the tomato conditions.

#### High quality products

The nature of imec film generates an enormous number of capillary roots to efficiently ingest nutrients. As a result, the tomatoes cultivated with imec have a good taste, aroma, very high sugar content and nutritional value (lycopene, amino acid, gamma aminobutyric acid, etc.) and have gained good reputation.

According to the recent Consumer Trend Survey, safe, secure and highly-nutritious vegetables tend to be chosen by consumer even if the prices are a bit high. This tendency to "prefer quality to quantity" is matching the concept of imec.

In fact, tomatoes produced with imec by many different farmers are evaluated in various ways such as wining many prizes.

Also, we have received many messages from mothers saying that children who hate tomatoes came to happily eat them.



Different kinds of fruit tomato cultivated with imec

#### Easy farming for anybody

The soil is the main factor for agriculture, but it is very difficult for us to accurately control its nature because it depends on the place and season.

It is said to take 10 years to make soil and acquire watering technique for the stable production of high-quality tomato (called fruit tomato). By using the imec film which is a uniform industrial product instead of soil, even inexperienced people can learn reproducible agriculture in a short period of time.

In fact, more than 60% of the people who introduced the imec system until now are non-farmers. Many people from the other business fileds are adopting the imec system and joining the agriculture, producing and selling high-quality tomatoes from the very first year.

Today, more than 120 farmers are using imec. Based on the increasing knowledge and experience every day, we have been working on the securer technology.



#### Sustainable agriculture anywhere



Imec farming system in UAE (United Arab Emirates)

With imec, you produce high-quality vegetables even in the desert, with the contaminated or salt-damaged soil and inside the building.

It is completely isolated from the ground by water stop sheet, so it does not get affected by the soil. At the same time, since the supplied water and fertilizer do not leak out, the amount of water and fertilizer used is much less than conventional farming methods. It is a very friendly farming method to the environment.

Currently, the introduction of the imec farming is progressing in the desert areas of UAE (United Arab Emirates) and in the areas with the pollution risk in China.

We shall be very pleased to help to create employment with imec in the areas unsuitable for agriculture, help the economy recover, and help the people regain hope.

#### **Overview of imec Farming System**



#### Structure of imec Farming Bed





Put weed preventing sheet in the leveled and rolled soil culture house and place farming bed framework on it.



Set regular planting panel (6) and upper irrigation tube 7



Spread water stop sheet , then place lower irrigation tube 2 and water repellent cloth (3)



Cover with multi film



Spread imec film 4



Complete to plant seedling



Lay down approx. 1 cm thick peat moss  ${\scriptstyle(5)}$ 



Start harvesting after approx. 2-3 months!

Contact us !



Plant regeneration enriches human life



https://www.mebiol.co.jp/en/company/

3F Ikeda Scientific Building, 1-25-8 Nakahara, Hiratsuka-shi, Kanagawa, 254-0075, Japan Tel:+81 463-37-4301 Fax:+81 463-37-4302