

# READY TO ROLL

A Japanese partnership is preparing to put down roots in arid climates overseas.

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**K**NIT textile manufacturer Mitsukawa Co. and Toray Industries have jointly developed a product which enables the cultivation of vegetable crops in arid climates when used in conjunction with technologies from partner companies.

Growing vegetables in desert-like lands is challenging because the plants are vulnerable to wind and the movement of sand. Growing vegetables on degraded land is likewise difficult because of the poor soil. Roll Planter, the technology developed by the aforementioned two companies, solves this problem

by providing an environment in which a plant can quickly and firmly take root.

In the new technology, mesh fabric tubes measuring about 10 centimeters in diameter are filled with soil and laid out on the barren land in adjoining rows of two or three tubes. Crop seeds are planted along the depression where the tubes meet. The seeds do not require much watering – although a drip irrigation system is required in arid land – because the planter’s fine mesh keeps the soil sufficiently moist to grow vegetables.

“I was watching a TV program on desert greening, and an idea to apply our textile technology in environmental fields came to me in a flash,” says Shigeto Matsumoto, president of Mitsukawa Co. “Roll Planter employs



In this trial in South Africa, Roll Planter transformed barren land (top) into a field of Swiss chard and Chinese cabbage (bottom).  
Photo: Courtesy of Mitsukawa Co.



The Roll Planter trial in Tamil Nadu, southern India, produced double the amount of cauliflower grown in other local areas.  
Photo: Courtesy of Mitsukawa Co.



Mitsukawa Co. President Shigeto Matsumoto (left) and colleague Yoshiyuki Tsujioka with a coil of their Roll Planter product.  
Photo: Akira Umezawa



Roll Planter  
Photo: Courtesy of Mitsukawa Co.

an extremely fine mesh which prevents the soil inside from coming out but is nevertheless penetrable by a plant's roots, which push through the fine mesh."

The material used for the mesh, developed by Toray, is called "polylactic acid fiber," which is a material featuring excellent ultraviolet resistance and high durability. Polylactic acid fiber is a derivative product of cornstarch (corn) and is naturally decomposed into water and carbon dioxide with no adverse impact on the environment, returning to the soil completely after about five to ten years, long enough after the crop it helped nurture has become established.

Beginning in China in 2004, Mitsukawa Co. has taken steps to promote environmental projects around the world aimed at preventing the further expansion of desertification and transforming degraded land into farmland. An example of such efforts is the project in South Africa that was advocated as part of the Greening of Mine Dumps and Development of Business Model for Promoting Agriculture initiatives, which were supported by Japan's Ministry of Economy, Trade and Industry and the United Nations Development Programme (UNDP) between 2012 and 2013.

Mitsukawa Co., Toray, and Netafim Japan, a manufacturer of drip irrigation systems that enable the efficient use of water in agriculture, jointly undertook a cultivation trial deploying Roll Planter across barren land and concrete-covered areas encompassing 1,500 m<sup>2</sup> in Soweto, in the suburbs of Johannesburg. Corn,

green peppers, Chinese cabbage and Swiss chard were successfully grown by a local farm cooperative in the trials, proving that Roll Planter is effective in growing vegetables even on barren land. More than half of the land in South Africa is subject to an arid climate, with less than 20% of the total land being suitable for agricultural use. Given this situation, expectations are high that Roll Planter can help achieve the further expansion of farmland in the country.

In 2015, Mitsukawa Co. carried out a cultivation trial in the southern Indian town of Coimbatore in Tamil Nadu, one of India's most arid areas, with the support of the Japan International Cooperation Agency (JICA). The trial was undertaken in collaboration with a local agricultural college at its campus farms and on farmland near the school. This region is disadvantaged in agricultural terms because its soil is largely composed of clay, which is poor for water drainage. By deploying Roll Planter however, the trial produced double the amount of cauliflower grown in control areas outside the trial sites.

"We still have some issues to overcome with respect to business profitability, but we have launched local production of Roll Planter in South Africa," says Matsumoto. "With our technology, we hope to contribute to improving agricultural productivity and creating employment opportunities in countries that are confronted with a lack of farmland and other serious issues." 