Getting ready to grow greens on the Red Planet

With the world’s food supply under growing stress, scientists are coming up with innovative ways to improve food production. Samantha Boh looks at some of these technologies in Wageningen University and Research in the Netherlands and Nanyang Technological University, Singapore.

The prospect of a Mars colony is a step closer to reality with Dutch scientists having harvested more than a dozen crops grown in simulated Mars soil right here on Earth.

Now the scientists are asking if plant growth can be sustained there. Dr Wieger Wamelink, who heads a team from Wageningen University and Research in successfully growing crops in soil simulant, is optimistic that they can also grow herbs in the simulant.

“Now the solution comprises soil simulants,” he said. “This could mean an important step towards producing food more effectively on Mars, which means less time or space would be needed to grow a healthy diet for future Mars residents.”

Earth and Mars soil simulants differ in their composition and moisture content. “We are confident we can be successful with both and that we can reduce the concentration of the potentially harmful effects of heavy metals, such as copper, lanthanum and lead,” Dr Wamelink said.

It is hoped that the indigenous crops can be grown in low-gravity conditions. “The crops can also be used for research,” Dr Wamelink said.

The consortium, which started last year, received millions of dollars in funding. The WUR team has formed a consortium including a flavour house, ingredient producers and a packaging company.

Turning soya bean waste into packaging

Once doomed as food waste, discarded soya bean residue has now been harnessed by researchers and turned into a new material for use in the packaging industry.

Dr Vian Agtmaal, director of the Food Science and Technology Programme at the Singapore University of Technology and Design, used soya bean residue, also known as okara, to create biodegradable packaging.

The residue is treated with alkali and enzymes to break down proteins and create a raw material to create a firm composite made of proteins and cellulose. “Soy residue can be as high as 70 per cent protein, making it a great waste product to transform into food-grade protein,” Dr Agtmaal said.

Laboratory experiments found that the proportions of cellulose, hemicellulose, starch, ash, pectin, and proteins were similar to those found in the soya beans. Dr Agtmaal said soya bean residue has a similar protein and ash content and is comparable to flour.

The residue is treated with alkali and enzymes to break down proteins, Dr Agtmaal explained.

The consortium, which started work in January, has already received non-disclosable research funding.

Food of the future

Dr Wieger Wamelink with samples of plants grown in soil simulator and Mars soil simulant.

The biologist and ecologist is raising the potential of developing a sustainable ecosystem in space.

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