

First on the Martian menu: spuds

March 30 2017, by Franklin Briceno



In this March 16, 2017 photo, Peruvian scientist David Ramirez points to a potato plant in a simulator akin to a Mars' conditions, in Lima Peru. Sprouting from dry Peruvian desert soil, hope for one day growing food on Mars is emerging in the form of a potato plant. (AP Photo/Martin Mejia)

If human beings finally reach Mars, they may find themselves depending on the humble, if hardy potato.

Scientists in Peru have used a simulator that mimics the harsh conditions on the Red Planet to successfully grow a small potato plant.

It's an experiment straight out of the 2015 Hollywood movie "The Martian" that scientists say may also benefit arid regions already feeling the impact of climate change.

"It's not only about bringing potatoes to Mars, but also finding a potato that can resist non-cultivable areas on Earth," said Julio Valdivia, an astrobiologist with Peru's University of Engineering and Technology who is working with NASA on the project.

The experiment began in 2016—a year after the Hollywood film "The Martian" showed a stranded astronaut surviving by figuring out how to grow potatoes on the red planet.

Peruvian scientists built a simulator akin to a Mars-in-a-box: Frosty below-zero temperatures, high carbon monoxide concentrations, the air pressure found at 6,000 meters (19,700 feet) altitude and a system of lights imitating the Martian day and night.

Though thousands of miles away from colleagues at NASA's Ames Research Center in California providing designs and advice, Peru was in many ways an apt location to experiment with growing potatoes on Mars.



In this March 16, 2017 photo, a potato plant grows inside a Mars simulator in Lima, Peru. The simulator mimicks the harsh conditions found on Mars. (AP Photo/Martin Mejia)

The birthplace of the domesticated potato lies high in the Andes near Lake Titicaca, where it was first grown about 7,000 years ago. More than 4,000 varieties are grown in Peru, Bolivia and Ecuador, where potatoes have sprouted even in cold, barren lands.

The Peruvian scientists didn't have to go far to find high-salinity soil similar to that found on Mars, though with some of the organic material Mars lacks: Pampas de la Joya along the country's southern coast receives less than a millimeter of rain a year, making its terrain somewhat comparable to the Red Planet's parched ground.

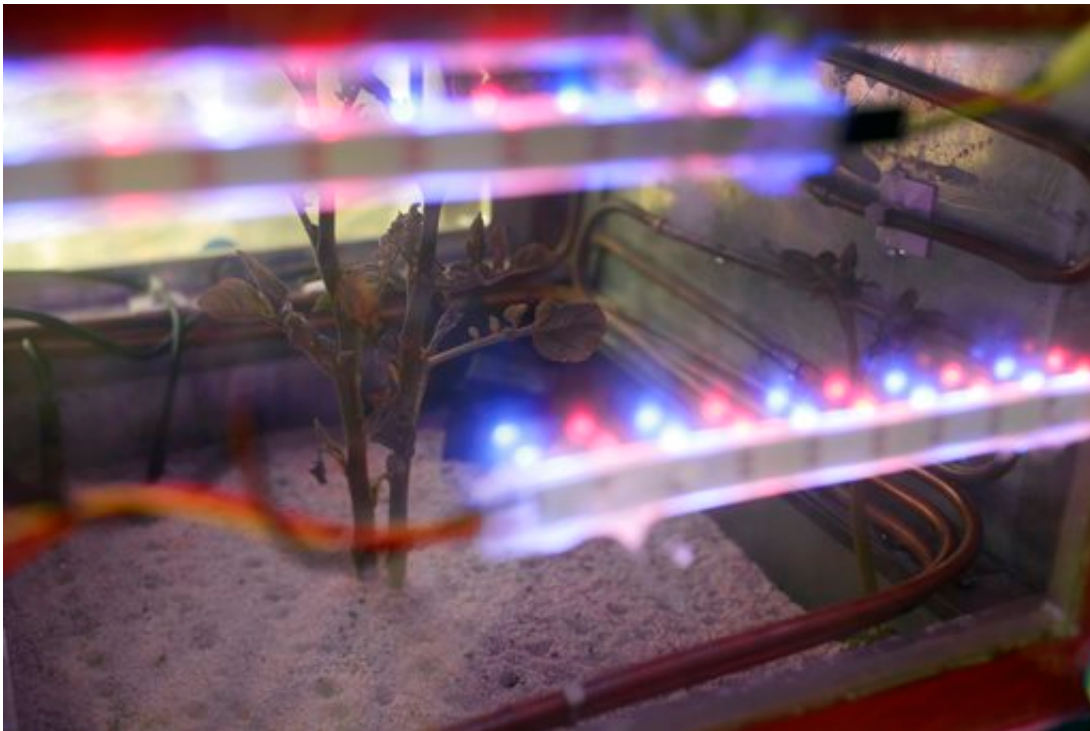
International Potato Center researchers transported 700 kilos (1,540

pounds) of the soil to Lima, planted 65 varieties and waited. In the end, just four sprouted from the soil.

In a second stage, scientists planted one of the most robust varieties in the even more extreme conditions of the simulator, with the soil—Mars has no organic soil—replaced by crushed rock and a nutrient solution.

Live-streaming cameras caught every tiny movement as a bud sprouted and grew several leaves while sensors provided around-the-clock monitoring of simulator conditions.

The winning potato: A variety called "Unique."



In this March 16, 2017 photo, a potato plant grows inside a Mars simulator in Lima, Peru. "It's a 'super potato' that resists very high carbon dioxide conditions and temperatures that get to freezing," said Julio Valdivia, an astrobiologist with Peru's University of Engineering and Technology. (AP Photo/Martin Mejia)

"It's a 'super potato' that resists very high carbon dioxide conditions and temperatures that get to freezing," Valdivia said.

NASA itself also has been doing experiments on extraterrestrial agriculture, both for use on spacecraft and perhaps on Mars.

Ray Wheeler, the lead for advanced life support research activities at NASA's Kennedy Space Center, said plant survival in the open on Mars would be impossible given the planet's low-pressure, cold temperature and lack of oxygen, but showing plants could survive in a greenhouse-type environment with reduced pressure and high carbon-dioxide levels could potentially reduce operating costs. Most research on growing plants in space has focused on optimizing environments to get high outputs of oxygen and food.

"But understanding the lower limits of survival is also important, especially if you consider pre-deploying some sort of plant growth systems before humans arrive," he said.

In the next stage of the experiment, scientists will build three more simulators to grow potato plants under extreme conditions with the hope of gaining a broader range of results. They will also need to increase the carbon dioxide concentrations to more closely imitate the Martian atmosphere.

© 2017 The Associated Press. All rights reserved.

Citation: First on the Martian menu: spuds (2017, March 30) retrieved 23 June 2024 from <https://phys.org/news/2017-03-martian-menu-spuds.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.