

# First tomatoes and peas harvested on Mars and moon soil simulant

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The second experiment on how to grow crops on Mars and moon soil simulant have given a surprising outcome. As a result of what the researchers of Wageningen University & Research centre in the Netherlands learned from their first experiments, they were able to grow ten different crop species. Tomatoes, peas, rye, garden rocket, radish and garden cress were harvested.

"The total above ground biomass produced on the Mars soil simulant was not significantly different from the potting compost we used as a control", says researcher Dr Wieger Wamelink. The goal of the experiments is to provide the basis for growing crops on Mars and on the moon, in order to feed the first settlers.

## **Moon soil simulant**

A few improvements have been made since the first experiment. Wamelink: "We used trays instead of small pots and added organic material (fresh cut grass) to the Mars and moon soil simulant. This solved the problem we had with watering in the first experiment and also added manure to the soils." In particular the crop growth on the moon soil simulant showed improvement. Where in the first moon soil experiment most plants died, in the next round they flourished and the researchers could harvest from the same species as on the Mars soil simulant and the earth potting compost control.

## **Great potential**

The production of biomass on the Mars soil simulant was lower than on the earth control, but it was a minor difference and caused by one of the trays that showed less growth. It was also not statistically different from the earth control. "That was a real surprise to us", comments Wamelink. "It shows that the Mars soil simulant has great potential when properly prepared and watered. The biomass growth on the moon soil simulant was less than on both other soils, about half of the biomass. Only the spinach showed poor biomass production."

## **Heavy metals**

Although the Wageningen researchers harvested several edible crops,

they did not eat them. Wamelink: "The soils contain heavy metals like lead, arsenic and mercury and also a lot of iron. If the components become available for the plants, they may be taken up and find their way into the fruits, making them poisonous. Further research on this is necessary and that is one of the reasons why a crowdfunding campaign has been started to finance the third experiment that will be all about food safety. The experiment should start in April 2016 with the growth of a new batch of crops including potatoes and beans. If the crops prove to be safe enough to eat, the funders will be invited for dinner where a 'Martian meal' will be served that includes the harvested [crops](#); at least for those who dare!."

## **The experiment**

The soil experiment began in April 2015. Final harvest took place in October 2015. Ten different crop species (tomato, rye, radish, pea, leek, spinach, garden rocket, cress, quinoa and chives) were sown in trays with either Mars or moon soil simulant and earth potting compost as a control. Plants were cultivated in a glass house under constant temperature, humidity and light conditions and under earth atmosphere. "This is because we expect that first crop growth on Mars and moon will take place in underground rooms to protect the plants from the hostile environment including cosmic radiation", states Wamelink. The Wageningen UR researchers use Mars and moon soil simulants provided by NASA, that mimic Mars and moon soil as closely as possible. The Mars soil simulant originates from a volcano on Hawaii and the moon soil simulant from an Arizonian desert.

**More information:** [www.facebook.com/Food.for.Mars.and.moon/](http://www.facebook.com/Food.for.Mars.and.moon/)

Provided by Wageningen University

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