

A NEW LIFEFORM TAKES ROOT ON THE INTERNATIONAL SPACE STATION

It's spring, and all around the northern hemisphere gardeners are planting seeds, tilling soil, and watering crops. Imagine a gardener's surprise, however, if water from the hose, instead of hitting the soil and sinking in, floated up to the sky. Or if the soil itself rose up from the ground and fled the garden. That's exactly the kind of dilemma astronauts onboard the ISS have faced for years. Without gravity, how do you make your garden grow?



The situation is even more confusing for plants. In a weightless environment, up and down has no meaning, so roots grow in odd, chaotic directions. Shoots that emerge from the soil in search the sun find, instead, a cold metallic lamp that never rises or sets. And needless to say, it never rains onboard the space station. On April 18th, SpaceX-3 blasted off from Cape Canaveral with a possible solution to these problems.

"We call it 'Veggie'," says Gioia Massa of the Kennedy Space Center. It is a plant growth chamber designed to make gardens thrive in absence of gravity that should make it is possible to grow plants in the weightlessness of space. Massa, who leads the Veggie science team, has been working on the project for years. Veggie's heritage traces back decades to experiments with plants on board the Russian space station Mir and NASA's space shuttle. In all that time, NASA astronauts have never tasted home-grown food in space—but that could soon change. The first crop will be a variety of lettuce called 'Outredgeous,' and it should be delicious.



Veggie solves the problems of weightlessness using 'plant pillows.' Basically, these are bags of 'space dirt' and slow-release fertilizer, with wicks inserted into the bags to draw water into the soil where it cannot float away. In addition to guiding the water, the wicks act as a kind of gardening stake. The seeds are carefully glued to the wicks, oriented so the roots can grow 'down' into the soil and shoots pop out of the bag.



When the shoots emerge, they find an array of LEDs shining overhead, providing light for photosynthesis and a sense of direction to keep the shoots moving "up." The bellows-like walls of the chamber allow it to expand to make room for the growing crop. Veggie often show the chamber flooded with a mixture of red and blue light which makes the plants appear gray and unappetizing. But that's the colour of light plants use most for photosynthesis,

The appearance of a garden is important to humans because gardening has psychological as well as nutritional benefits. Compared to Earth, spaceships are a relatively lifeless environment, cold, metallic and sterile. Plants allow astronauts to form a connection to living things, which has a huge balancing effect.



SpaceX's Dragon delivered Veggie to the International Space Station on Sunday, April 20th, chalking up another success for commercial space flight. Outredgeous should be ready for harvesting in late May, but astronauts won't be allowed to taste-test. First, the lettuce has to be brought home for analysis to check if it is safe to eat? If everything checks out, future crops may be eaten. Salad anyone?

AK from NASA Notes