

Veggie will expand fresh food production on space station

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Outredgeous red romaine lettuce plants grow inside in a prototype Veggie flight pillow. The bellows of the hardware have been lowered to better observe the plants. A small temperature and relative humidity data logger is placed between the pillows small white box, central. Credit: NASA/Gioia Massa

A plant growth chamber bound for the International Space Station inside the Dragon capsule on the SpaceX-3 resupply mission may help expand

in-orbit food production capabilities in more ways than one, and offer astronauts something they don't take for granted, fresh food.

NASA's Veg-01 experiment will be used to study the in-orbit function and performance of a new expandable plant growth facility called Veggie and its plant "pillows." The investigation will focus on the growth and development of "Outredgeous" lettuce seedlings in the spaceflight environment.

"Veggie will provide a new resource for U.S. astronauts and researchers as we begin to develop the capabilities of growing fresh produce and other large plants on the [space station](#)," said Gioia Massa, NASA payload scientist for Veggie. "Determining food safety is one of our primary goals for this validation test."

Veggie is a low-cost plant growth chamber that uses a flat-panel light bank that includes red, blue and green LEDs for plant growth and crew observation. Veggie's unique design is collapsible for transport and storage and expandable up to a foot and a half as plants grow inside it.

"The internal growing area is 11.5 inches wide by 14.5 inches deep, making it the largest [plant growth](#) chamber for [space](#) to date," Massa said.



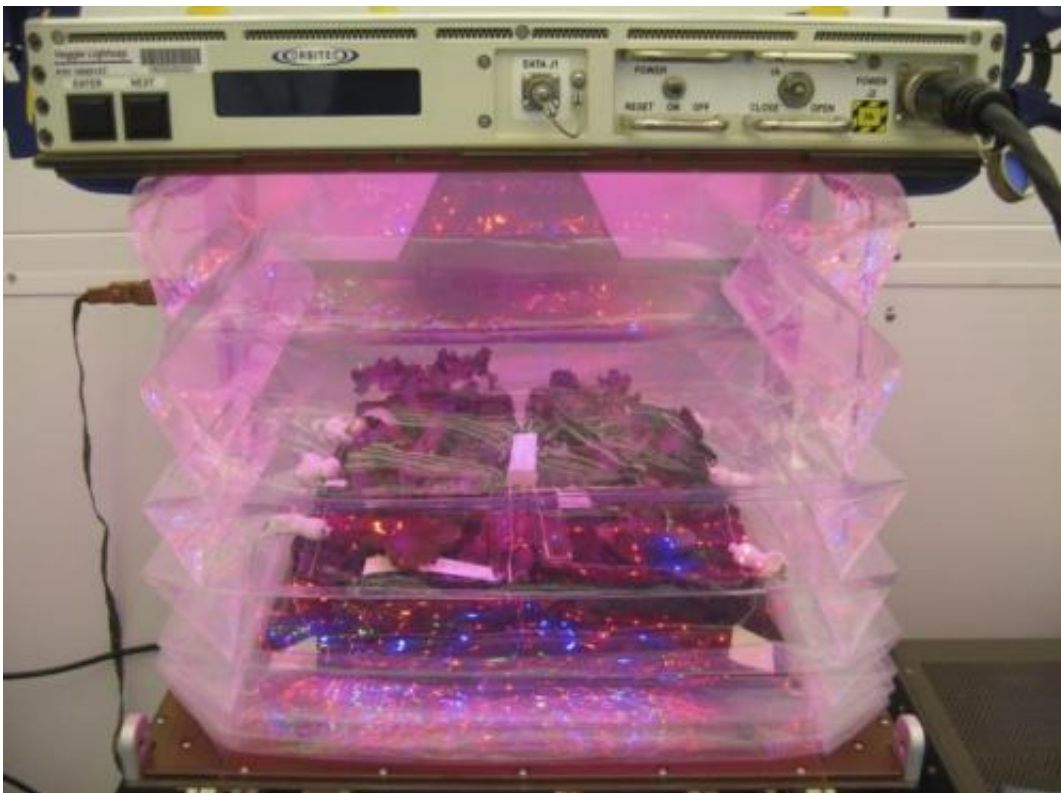
A 28-day-old Outredgeous red romaine lettuce plant grows in a prototype v flight pillow. US astronauts living and working aboard the International Space Station are going to receive a newly developed Vegetable Production System Veggie. Credit: NASA/Gioia Massa

Orbital Technologies Corporation (ORBITEC) in Madison, Wis., developed Veggie through a Small Business Innovative Research Program. NASA and ORBITEC engineers and collaborators at NASA's Kennedy Space Center in Florida worked to get the unit's hardware flight-certified for use on the space station.

Because real estate on the station is limited, some adjustments to the growth chamber were made to accommodate space requirements. At Kennedy's Space Life Sciences Laboratory, a crop of lettuce and radishes was grown in the prototype test unit. Seedlings were placed in

the Veggie root-mat pillows, and their growth was monitored for health, size, amount of water used, and the microorganisms that grew on them.

"I am thrilled to be a member of the Veggie and Veg-01 team and proud of all the work we have done to prepare for flight," Massa said. "Our team is very excited to see the hardware in use on the space station."



Outrageous red romaine lettuce plants grow inside the bellows of a prototype Veggie flight pillow. It will launch aboard SpaceX's Dragon capsule on NASA's third Commercial Resupply Services mission targeted to launch April 14 from Space Launch Complex 40 at Cape Canaveral Air Force Station. Credit: NASA/Bryan Onate

As NASA moves toward long-duration exploration missions, Massa

hopes that Veggie will be a resource for crew food growth and consumption. It also could be used by astronauts for recreational gardening activities during long-duration space missions. The system may have implications for improving growth and biomass production on Earth, thus benefiting the average citizen.

For the future, Massa said she is looking forward to seeing all sorts of "neat payloads" in the Veggie unit and expanding its capability as NASA learns more about the food safety of crops grown in microgravity.

Provided by NASA

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