

NASA planting seeds to grow more edible plants on space station

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Chinese cabbage leaves are shown aboard the International Space Station. Photo from NASA.gov

Veggies are good for you. If you need proof, just ask the scientists at NASA, the U.S. space agency.

On Tuesday, NASA launched a rocket from the Cape Canaveral Air Force Station. The spacecraft carried supplies and scientific equipment to the International Space Station (ISS).

Also on the rocket was a new experiment: the Advanced Plant Habitat (APH).

Food For Astronauts In Space

Astronauts will use the APH to learn how to grow vegetables and other plants in space.

NASA has been hoping to raise plants in space for years. Any future astronauts who land on Mars will need a reliable food supply. They'll probably need more than they can bring from Earth.

The astronauts would need to be fed both during the trip to Mars and while living on it.

Experiments like APH will be an important test for finding the best ways to prepare veggies outside Earth, says Chris Wolverton. He is a plant scientist who studies plant gravity on the International Space Station.

Leafy plants are great sources of vitamins and minerals that keep humans healthy, Wolverton says.

New Version Of 2015 "Veggie" Program

The new Advanced Plant Habitat is actually a new version of a NASA program from 2015. It was called the Vegetable Production System (also known as "Veggie"). The Veggie program was able to produce lettuce for the crew on the space station. It was the first food grown by NASA in space for astronauts to eat.

The success of Veggie encouraged scientists to try new things with the APH project.

The new APH system will allow astronauts to control the air and light inside the room where plants grow. APH will also have brighter LED lights, which re-create the light of the sun. These lights are powerful enough to produce four times the amount of plants as the old system.

Scientists will learn lots of important information about future food growing on Mars, says Bryan Onate. He is helping to lead the new APH project.

Of course, APH won't be useful just for making food. The unit has many sensors and cameras. It will show scientists how plants grow outside our planet. Changes in gravity and light can affect the growth of living things in unexpected ways.

Low Gravity Presents Growing Challenge

Gravity is the force that pulls humans closer to earth. It's why you come back down when you jump. Astronauts in space are further away from the pull of gravity on Earth.

One of the major problems with growing plants in low gravity, Wolverton says, is due to the way water moves. It tends to form into droplets. In turn, when these droplets form on a plant, they can burst at a moment's notice. This can flood the plant and keep it from breathing in the oxygen it needs.

That's just one challenge. Without normal Earth gravity, plants can even have trouble telling which way is up, he adds.

For its first experiments, the APH system will be tested with two kinds of seeds: a type of leaf, like cabbage, and a type of wheat. If all goes as planned, the cabbage-like plant will be the main crop for APH's first experiment.

Preparing Astronauts For Future Trips To Mars

Eventually, scientists hope astronauts will be able to use the system to grow larger plants. But the main goal of APH is simply to see how plants might grow on other planets. This will prepare astronauts for future trips to Mars, says Edward Guinan. He's a professor of astronomy at Villanova University in Pennsylvania.

Mars is cold, Dr. Guinan says, so plants will need to be grown in hot, sticky greenhouses there. Mars also gets about half the sunlight that Earth does, he points out. Mars is further away from the Sun than the Earth.

Less light and strange soil on Mars could make it tough for plants to survive. But without these experiments, there's no way to know how Earth vegetables would live on Mars.

"Certain plants might do better than others," Guinan adds. "The experiments on the International Space Station will help answer some of these questions."

Quiz

- 1 Which two of the following are the MAIN ideas of the article?
1. *The Advanced Plant Habitat will allow astronauts to grow large amounts of plants in space.*
 2. *Mars is a cold planet, so it will be difficult for plants to grow there.*
 3. *NASA wants to be able to grow plants in space so that astronauts can have a food supply on Mars.*
 4. *Scientists are unsure of which plants will grow better than others in space.*
- (A) 1 and 2
- (B) 1 and 3
- (C) 2 and 4
- (D) 3 and 4
- 2 Which answer choice BEST reflects the MAIN goal of APH?
- (A) to grow the largest plants possible in space
- (B) to develop better ways of farming than those used on Earth
- (C) to learn about how plants grow on other planets
- (D) to see whether cabbage or wheat grows better on other planets
- 3 According to the article, how will APH make plants grow in places that do not get as much sunlight as Earth?
- (A) The system will have bright LED lights that imitate the sun's light.
- (B) The system will be heated to so plants feel warmth similar to the sun.
- (C) The system will use cameras and sensors to project sunlight from Earth onto the plants.
- (D) The system will record how plants react to the sunlight available on other planets.

- 4 In the section "Food For Astronauts In Space," how is Chris Wolverton introduced?
- (A) through his description of how the APH system will make plants grow in space
 - (B) through his research on how much food astronauts will need for the trip to Mars
 - (C) through his opinion on the types of vegetables astronauts will prefer to eat in space
 - (D) through his explanation of why growing plants in space is important