

ONIONS IN SPACE



TEXAS TECH RESEARCHERS WORK WITH NASA TO GROW CROPS THAT NOURISH, PROTECT AND PROVIDE BREATHABLE AIR FOR SHUTTLE ASTRONAUTS. THE PROJECT ALSO INTERESTS GRADE SCHOOL AND HIGH SCHOOL STUDENTS IN SCIENCE.

Gone are the days of freeze-dried ice cream and Tang at NASA, at least if Texas Tech University researchers have their way. Ellen Peffley is spearheading an initiative that may offer astronauts a little variety at dinnertime.

"We were initially asked by NASA for a strategy to grow vegetables hydroponically," says this Tech horticulture professor. "We had first set out to grow a bulb onion, much like the ones in the store you probably think of."

But Peffley's team quickly learned that growing a bulb onion is highly inefficient, mainly due to the number of inputs involved.

So instead they grew green onions.

NASA wanted to get the most biomass possible from the onions in the shortest time. This meant Tech researchers had to experiment with the spacing between individual plants during the growing process, and determine at what point in the growing cycles the shoots could best be harvested and produce new leaves.

"From the time we plant seeds it takes about 28 days for the seedlings to get to leaf stages, and at that point they're about 7 inches tall and the tops can be cut back and new leaves form," Peffley says.

NASA officials wanted to explore ways to grow vegetables in a space environment with no soil and high carbon dioxide. The plan was not only to offer astronauts fresher fare during space voyages, but also to take advantage of photosynthesis. Plants can scrub the high volume of carbon dioxide present in the closed systems in space travel and generate oxygen. Phytochemicals found in onions may offset the effects of radiation, which are more prevalent in space.

"So obviously, this crop has tremendous benefits for astronauts," Peffley says.

The information and data gathered by Texas Tech researchers was so compelling it has been used by the Kennedy Space Center in NASA experiments and is expected to be tested on future space shuttle missions.

One phase of the experiments was conducted on the Space Shuttle Columbia mission in 2003, but no data was recovered after the shuttle was tragically destroyed on re-entry.

Because NASA meticulously plans shuttle-based research initiatives almost two years in advance, it is difficult to determine when the crops will be

studied on a mission.

The research also allows Peffley to explore another issue close to her heart; declining interest in science among grade school and high school students in the United States.

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In an effort to offset flagging interest in the sciences, Peffley uses her team's laboratories as a vehicle to kindle interest among area school children in work being performed at the university, and the onion project attracts that interest. Since NASA strongly encourages contracted researchers to have an outreach component, Peffley's work fits right in.

"It's great to get kids excited about science," she says. "We work together as a team for NASA and for the children in our community, and I think that's what is most exciting."

— MICHAEL CASTELLON