

**C O M M U N I T Y N E W S****Sweet success for Advanced Life Support researchers**

**S**cientists are one step closer in their pursuit of food systems for the next generation of space exploration. In late January, agriculturists in JSC's Advanced Life Support Development Facility harvested the first-ever crop of chamber grown sweet potatoes, one of the Advanced Life Support Program's candidate crops.

The sweet potatoes are indistinguishable from your common grocer's pick but to the team that has been charged with investigating sustainable food solutions for long-term space voyages of the future, the harvest represents sweet success.

"This represents a significant test, both for Tuskegee University and for NASA," explained Dr. Dan Barta, NASA Horticulturist/Plant Physiologist. "This recent test represents a large scale, closed atmosphere where we actually were able to do some things we were not able to do previously. In addition to yield, the rate of photosynthesis of the crop was characterized. Plants can contribute to the purification of air by producing oxygen and removing carbon dioxide. Based on this test, we now have data to predict how much planted area would be required to meet a person's oxygen requirement.

Tuskegee University, a NASA University Research Center, has been tantamount to the progress of the food systems development through its Center for Food and Environmental Systems for Human Exploration of Space. URCs focus on a specific area of NASA interest and are sponsored by NASA's Minority University Research and Education Program, the Equal Opportunity Programs, Aerospace Technology, Life and Microgravity Sciences and Applications, Earth and Space Science, and Space Flight.

"JSC provides the hands-on technical collaborations and management of the Tuskegee URC," said Lupita Armendariz,

manager of the MUREP at JSC.

Dr. Desmond Mortley, associate professor of Plant Science at Tuskegee University, teamed with Barta and Dr. Keith Henderson, NASA plant scientist, to design and conduct the test. Dr. Walter Hill, dean of the College of Agricultural, Environmental and Natural Sciences and director of the George Washington Carver Agricultural Experiment Station, recently visited JSC plant growth facilities to inspect the crop and return with experimental material for evaluation at Tuskegee. Hill was accompanied by Dr. Audrey Trotman, an environmental microbiologist who will explore how sweet potatoes can be used in waste recovery systems.

"We at Tuskegee University are absolutely delighted about the yield of sweet potatoes that was produced here at JSC," said Hill. "It's historical, it's phenomenal and it's going to make a difference in the program in the long term."

The work with crop plants also includes the development of highly fertile artificial soils, defining the amount of water recycling that can be achieved by plant transpiration, as well as utilization of resources recovered from solid wastes.

"Advanced life support systems are the next step in long term space exploration – be it to Mars, back to the moon or even to an asteroid," said Barta. "If a space habitat on another planets' surface is ever going to be self sufficient, then it needs to be able to produce food from recycled products – that's where plants come in."

A secondary goal of these growth experiments is using the knowledge gained to help food production challenges here on Earth.

"This research is of critical importance to many developing countries," explained Hill. "Many children and families rely on the sweet potato as a staple crop because of its nutritional value. We can apply the data learned carrying out objectives for

planetary exploration, to studies we are concurrently running in parallel to help improve situations on Earth."

The sweet potato crop, planted September 22, 1999, was hydroponically grown, that is, grown without soil using a water-based nutrition system. The crop was grown in a gas-tight controlled environment chamber for 17 weeks and was closely monitored.

However, instead of heading to the produce counter like most potatoes, this crop is headed to the lab for analysis. A small selection was dedicated to the food lab for 'sensory evaluation' – yep, you got it, a taste test. Researchers there sliced, diced and cooked the potatoes into various recipes, like sweet potato french fries, to gauge the taste value of the crop. The remainder of the crop will be sent to other labs for such things as

nutritional analysis, where they'll measure its various vitamin, protein, starch and carotene levels, as well as a tissue analysis that will reveal the mineral components of the produce such as calcium, nitrogen and magnesium. Yet another sample will go back into another chamber for shelf life studies to help determine exactly how well the potatoes react to storage conditions.

"We need to examine how this experimental crop compares to common field grown potatoes," explained Barta, the technical monitor for the Tuskegee research work.

All early indications are promising and the researchers are very pleased with the success of this initial crop, which yielded 125 pounds. ■

Photos available at:  
<http://advlivesupport.jsc.nasa.gov/>



NASA JSC Photo 2000-01213 by Benny Benavides

**REAPING THE REWARDS** – JSC with Tuskegee University recently harvested the first crop of chamber grown sweet potatoes, a process that may be needed for extended space missions. Shown here, left to right, Dr. Dan Barta, NASA; Dr. Don Henninger, NASA; Albert Behrend, NASA; Dr. Walter Hill, Tuskegee University; and Dr. Audrey Trotman; Tuskegee University, hold a tray of the chamber potatoes. A tray of "inedibles" (ground up leaves and roots) that will be investigated for resource recovery is in front.

**NASA Houston Livestock Show and Rodeo exhibit draws large crowds**

**E**nthusiastic rodeo goers who visited the sprawling NASA exhibit at the Houston Livestock Show and Rodeo were treated to an out-of-this-world experience that had them kicking up their heels.

The show, which attracted record crowds this year, ran at the Astrodome complex from February 18 through March 5.

Located at an entrance to the packed Astrohall, the NASA exhibit drew huge crowds daily, providing educational presentations and interactive displays for space

fans and anyone interested in learning about the wonders of space exploration. The exhibit provided a fun way for people to learn about the nation's space program and about JSC's latest technologies and its community outreach programs.

"We wanted visitors to the rodeo to get a little taste of what goes on at the Johnson Space Center," said Louis Parker, JSC exhibits manager. "Hopefully, we have enticed kids and their parents to come down to JSC (for Open House) and check

us out further. We do more than just fly space shuttles."

Highlights included in the exhibit were computer-simulated games, where visitors could try their piloting skills in docking a shuttle to a space station, as well as demonstrations on what can happen if an astronaut isn't wearing a spacesuit. The main attraction for children – and some adults – was a picture booth where participants could have their photo taken in a spacesuit.

JSC's Space and Life Sciences Direc-

torate's exhibit at the Houston Livestock Show and Rodeo showcased how space food is packaged, the NASA bioreactor, vacuum chamber/life support activities, and the virtual astronaut Web site. Also, a team of technical experts was on hand to explain orbital debris and its impact to spacecraft.

Human Resources provided Web site access to various programs offered through the employee development branch at JSC as well as information for students wanting to obtain employment with NASA. ■

