

Space plants on way back to earth

December 18 2014, by Edwin Smith



Scene from the launch of SpaceX-4 in September 2014.

Farming in deep space is explored in the recent movie "Interstellar," but a University of Mississippi biologist's research program appears to be bringing the sci-fi scenario closer to reality.

The Seedling Growth Series of plant biology experiments is part of an agreement between NASA and the European Space Agency, said John Z. Kiss, dean of the UM Graduate School and NASA's principal investigator for the project. PIs from both agencies combined proposals to maximize scientific returns.

"The major goals are to determine how gravity and light responses influence each other in plants and to better understand the cellular signaling mechanisms of phototropism and cellular response of light stimulation involved," Kiss said.

The first phase of the space seedlings experiment was aboard the SpaceX-2 launch in March 2013 and returned on the SpaceX-3 in May 2014. The second phase traveled to the International Space Station on SpaceX-4 last September and is due to return on SpaceX-5 in January 2015.

Preliminary data indicates the plants are taking root, showing promise for future such experiments and eventually leading to actual extraterrestrial crops and harvests.

"In SG-2, we have successfully completed the reduced gravity series, which can be added to the series in SG-1," said Kiss, whose leading role as a NASA spaceflight researcher spans more than 20 years. "To our knowledge, for the first time in the course of plant space biology, we will have information on a physiological response across a continuum of gravity conditions."

Scientists are confident they have a sample size that will produce statistically significant results due to the robust design of their experiment. Findings will be published in respected peer-reviewed journals.

F. Javier Medina, a researcher at the Spanish National Research Council and ESA's PI on the [space](#) seedlings project, indicated the development of SG-2 operations in flight is quite satisfactory.

"The seeds have germinated at a good rate, and seedlings of all genotypes have shown a robust growth," Medina said. "In the first run of

the experiment, we have attempted for the first time the growth of seedlings under the constant conditions of gravity throughout the entire growth period, either micro-G or one-G."

Following the return of the seed cassettes and subsequent findings next month, NASA and ESA will develop SG-3, which is expected to launch on SpaceX-9 in late 2015. The development of SG-4 is to be determined.

Provided by University of Mississippi

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