

Haiyan Wang

*Plant Growth in Varied Soil Type and Air Pressure*

The Earth cannot sustain humans eternally, and the prospect of an extraterrestrial colony on Mars has become increasingly popularized recently as technology progresses. Due to restraints posed by transportation, it will be impossible to transport food to Mars as often as necessary. Therefore, a sustainable and efficient agriculture system must be developed for Martian farming, which is the basis of this experiment. Plants were grown in environments with air pressures and soil compositions that differed from the normal environment on Earth. Data about plant growth (mass and length of plants) was collected and grouped based on the environment in which the plant grew. This data was analyzed to show a relationship (or lack thereof) between a variable and the growth of plants. Based on past studies, growth of plants should be affected by such changes. At the end of the experiment, air pressure could be clearly seen affecting the mass of plants. A t-test carried out between the changes in masses of plants grown in Martian soil simulant and with the same amounts of fertilizer showed a t-test value of 0.0019, which shows that the two datasets are significantly different and therefore the growth of mass in plants are affected. This relationship and the data collected can be used to determine the ideal air pressure, amount of fertilizer, and soil type for plant growth which, if the ideal air pressure is lowered, could make Martian agriculture easier as Mars already has a significantly lower air pressure than Earth.