



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Samantha T. Crane	Project Number J1805
Project Title Efficacy of Human Excrement and Other Fertilizers in Dead Soil: Creating Lasting Food Sources for Deep Space Exploration	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this experiment is to determine the best fertilizers to use to create a sustainable food source for deep space exploration and colonization.</p> <p>Methods/Materials The Bush Blue Lake 274 string bean was the crop of choice. Gardening soil was used for plants in the control group. Washed plaster sand was used as dead soil. Fertilizers tested were store-bought fertilizer pellets, wood ash, and treated human excrements. They were tested in dead soil. Three grow bags were prepared for every fertilizer; each bag held three seeds. There were a total of nine plants for each fertilizer.</p> <p>Results At 17 days, the control group samples were just beginning to sprout. Plants grown in just dead soil were incredible pale, weak, and had started to rot. The store-bought fertilizer samples germinated, but had not sprouted. The wood ash samples sprouted and casing were splitting to reveal leaves. The excrement samples had an average stem height of 10 centimeters with two leaves each; these samples grew the healthiest and the fastest out of all the plants. At 40 days, all of the plants were growing. Plants in just dead soil died quickly after this reading. Excrement samples continued to grow faster and larger than the others. None of the plants samples survived or were observed long enough to produce bean pods.</p> <p>Conclusions/Discussion Excrement fertilized plants performed the best within the parameters of this experiment. Germination time was cut in half; this saved water, time, and resources. Excrement samples far outlasted other plants, which died due to lack of re-fertilization. What I learned from this project was that using properly prepared human excrements as fertilizer has the potential to save water, time, and resources when fertilizing dead, depleted, or foreign soils during deep space exploration.</p>	
Summary Statement Determine the efficacy of human excrement and other fertilizers in dead soil to create a nutrient rich, viable soil that can be used for a sustainable food source.	
Help Received My mother purchased supplies. My father taught me how to use Microsoft Excel.	