



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

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| Name(s) Teevyah Yuva Raju | Project Number S1917 |
| Project Title The Reversal of Harms Done by the Drought: How Carbon and Nitrogen Levels Affect F.O.L. in Soils to Impact Plant Growth | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals Food scarcity has become a prevalent problem facing our world today, in fact, the UN Food and Agricultural Organization finds that 795 million people are suffering from hunger which is further exacerbated by drought conditions. Farmers have less water to provide to their crops, making them more prone to the ascomycete fungal pathogen <i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i> race 3. Thus, the Encyclopedia of Food Microbiology writes that one of the major causes of food shortage is the <i>Fusarium Oxysporum</i> increase in countries. So, my objective was to determine whether or not an increase in Carbon and Nitrogen amounts in the soil influenced the <i>Fusarium</i>.</p> <p>Methods/Materials I conducted 5 Main Methods/Procedures and 5 Main Experiments which included the use of an autoclave, elemental analyzer, growth chambers, <i>Solanum Lycopersicum</i> (tomato) seeds, compound microscope, the 6 Main Soil Types farmers use, and <i>Fusarium oxysporum</i> f. sp. <i>Lycopersici</i> race 3.</p> <p>Results My hypothesis was correct. After an analysis of the different tests conducted throughout my experimentation, it is concluded that Carbon and Nitrogen do have a positive effect on the tomato plants. In regards to which soil performed the best, the Euic Soil produced the toughest plants with the least amount of disease severity because its soil properties were closest to the 25% ratio, described in the Soil Separation test; affirming my prior year's research.</p> <p>Conclusions/Discussion My project encourages the discussion on agricultural reform through soil studies and the understanding of the benefits of organic molecular formulas to improve crop yield. <i>Fusarium</i> has been a prevalent disease in the agricultural community for nearly a century now, but its ability to evolve has made it harder for farmers and scientists alike to eliminate it using synthetic solutions. However, my research is important because it demonstrates that my organic solution is able to suppress the harms of <i>Fusarium</i> while allowing farmers to save water by using the correct ratio of soil properties in any climate.</p> | |
| Summary Statement With different soil properties, in different conditions, do Carbon and Nitrogen influence <i>Fusarium</i> ? | |
| Help Received Laboratory Facilities | |