

## **Drought Stress Tolerance of Peanut Using PGPR with Orange Peel Amendments**

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Peanut provides over \$4 billion per year to the United States economy along with many health benefits. Drought is an issue that reduces these benefits, as it lowers nutrition and yield and can lead to disease in peanut. Due to factors such as an increasing global population and climate change, something must be done to manage drought stress in peanut. *Bacillus velezensis* (*Bv*) and orange peel powder amendments, which have increased growth promotion in legume crops, will be used to determine their effect on peanut drought tolerance performance. Orange peel is a cheap source of pectin that can provide *Bv* with carbon to supplement its growth promotion properties. It has also been used to help triple vegetation in a forest as well as control pathogens.

A greenhouse experiment was conducted over 135 days to monitor the effects of the previously mentioned inoculants on five different peanut genotypes. Measurements taken to determine the effects of these inoculants and genotype-environment interactions include relative water content, pot weight, Soil Plant Analytical Development Chlorophyll Meter Readings, transpiration efficiency, mid-day photosynthesis, CO<sub>2</sub> curves, specific leaf area, biomass measurements, and N<sub>2</sub> fixation. These results will then be analysed and visualized using R. The first hypothesis for this experiment is that orange peel powder amendments may enhance *Bv* drought tolerance in peanut compared to using only *Bv*, and the second one is that genotype-environment interactions may occur between the genotypes and inoculation treatments. If these hypotheses are proven correct, these genotypes and inoculation treatments can be studied in later greenhouse and field trial experiments to help farmers grow peanuts more efficiently.