Analysis of Drought Tolerance Conferred by Plant Growth Promoting Rhizobacteria from Symphoricarpos

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The potential for plant growth promoting rhizobacteria (PGPR) to improve plant growth under drought conditions would help lower the watering requirements, while maintaining a healthy yield, thus helping to conserve precious water. The purpose of this project was to identify the PGPR which could produce ACC deaminase, as well as determining their ability to perform phosphate solubilization, N-fixation, and to produce IAA. To determine these PGPR properties, a zone of solubilized phosphates was to be observed on plates which had PGPR capable of that property. For N-fixation, growth was observed by bacteria on plates which lacked all Nitrogen. For IAA production, LB broth was amended with Tryptophan, and the supernatant was combined with Salkowski's Reagent, at which point the absorbance was read at 525nm. In addition, a plant growth study was conducted to determine the extent to which each individual strain would improve plant growth under both drought and normal conditions. Of the 13 strains able to produce ACC and survive under drought conditions, 7 strains were able to perform N-Fixation, and 2 different strains were able to solubilize phosphates. Strains 4, 5, 9, and 54 were found to significantly increase the growth of the wheat plant with regard to berry mass, total mass, and root length.

Awards Won: