The Effect of Oscillatoria on Flooded Glycine max

Martin, Jacob (School: Northwestern High School)

The purpose of this project is to test if Glycine max can withstand a flood for a longer duration with the addition of Oscillatoria. If Oscillatoria is added to submerged Glycine max, then the plant will survive longer under the circumstances of field flooding. The result of field flooding can be devastating to farmers all across the world. A control group of five soybean plants was taken and put under 2.5 centimeters of water above the soil line. The three experiemental groups went under the same procedure as the control, but then a type of Cyanobacteria called Oscillatoria was added to each tank at different times. The plants that received Oscillatoria statistically survived better than the plants who did not receive Oscillatoria. Plants in the control group decreased in height by -28.78%. Experimental Group 1 decreased in height by -19.16, but experimental Groups 2 and 3 increaed by 26.28 and 33.63% respectively. All experimental Groups had nodules used for nitrogen fixation while the control group had no sign of any nodules. Dissolved oxygen increased after Oscillatoria application and pH levels remained stabile throughout the whole experiement. The t-Test results for Group 1 (intial Oscillatoria application) came back not significant ($t=0.345<t=3.36$) and Groups 2 and 3 (two day and one week Oscillatoria application) came back highly significant ($t=3.57<t=3.36$) ($t=3.56<t=3.36$) respectively. Oscillatoria is a natural nitrogen fixator that allows soybean plants to survive under the conditions of flooding. The hypothesis is supported.

Awards Won: