The Effect of Added Polyamines on Glycine max Responses to Drought

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The purpose of this research was to discover if added polyamines affected the growth rates and root-to-shoot ratios of droughted and nondroughted soybean plants. Soybean plants were given exogenously added polyamines and placed into drought conditions. The height of each plant was measured every two or three days, and the growth rate was calculated using the slope of the line of best fit for each plant's graphed measurements. After 14 days of growth, each plant's dry biomass was divided into 'roots' and 'shoots,' and the root mass of each plant was divided by its shoot mass to determine the root-to-shoot ratio. The experiment was conducted twice—once with a moderate drought, and once with a severe drought. Two-way unbalanced ANOVA tests were run to determine significance. It was found that added polyamines had a positive significant effect on the root-to-shoot ratios of soybean plants in moderate drought conditions (p-value =.041), but not in severe drought conditions; however, drought had no effect on the root-to-shoot ratios in both moderate and severe drought. This result did not support the research hypothesis that added polyamines would lower the root-to-shoot ratios of droughted plants. Alternately, both added polyamines and drought were found to have a significant effect on the growth rates of droughted plants in severe drought conditions. Polyamines had a significant effect on growth rates throughout the experiment (p-value =.007). This result did support the research hypothesis that added polyamines would increase the growth rates of soybean plants in drought.

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