Priming for Success: Investigating the Effects of Hormonal Priming on Seed Germination Under Saline Conditions

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Salinity in soil is one of the greatest environmental stressors for plants. It has been estimated that worldwide 20% of total cultivated and 30% of irrigated agricultural lands are afflicted by high salinity. The purpose of this research was to determine if hormonal priming would alleviate salt stress in germinating sunflower seeds. The hormones studied included: gibberellic acid (GA3), ascorbic acid (ASA), salicylic acid (SA), indole-3-butyric acid (IBA), and indoleacetic acid (IAA). Each hormonal treatment group had 5 replicates under 3 saline conditions: no saline, low saline, and high saline. In each replicate, ten primed seeds were placed in a petri with a double layer of filter paper moistened with the appropriate saline solution. The seeds were then observed for germination and recorded daily for 7 days. At the end of the study, each of the 900 seedlings were measured for hypocotyl length. Based on this study the following conclusions were drawn. As salinity levels increased, seed germination and seedling growth decreased. Priming seeds with some hormones did enhance percent germination early on while other hormone treatments did not. The seeds in the ascorbic acid treatment group had the best percent germination rates under low saline conditions, and also had the longest hypocotyl length under no saline and low saline conditions.

Awards Won:
Missouri University of Science and Technology: Summer Camp scholarships (camp tuition and travel expenses, valued at up to $1,500)