A Comparison of the Effects of Thermotherapy and Electrotherapy on Soybean Plants

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It is imperative to develop new options for the development of high yielding and multiple stress and disease resistant cultivars of plants. The intention of this project was to determine if the use if electrotherapy or thermotherapy on plant seeds effected the plants anatomically and physiologically. It was projected that if thermotherapy is applied to a group of soybean seeds (before planting) and electrotherapy is applied to another group of soybean seeds (before planting); all treated seeds undergo parallel environmental elements, planting, and observation methods then, the thermally treated seeds will present evidence of being the most anatomically and physiologically developed and healthy. The plant's condition levels were based off of several factors including: the protein content of the plant (Bradford Assay), the proline content of the plant (Acid-Ninhydrin method), the chlorophyll content of the plant (Arnon's method), and the height and number of leaves produced by the plant. The data was analyzed using the Kruskal Wallis test to determine its significance. The outcome of the study presented evidence that, neither electrotherapy nor thermotherapy provided proof as a better treatment; however, the thermotherapy plants produced evidence that supports the theory that seed thermotherapy causes plants to mature faster physiologically. If the growth patterns by the thermic treated plants in this study are replicated, it could benefit farmers with short summers, countries with food shortages, and areas that prohibit the use GMOs, like Africa since thermic treatment is organic.

Awards Won:
Fourth Award of $500