The Effect of Low Voltage Electricity on the Plant Health and Germination of Raphanus sativus and Pisum sativum

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In the next 25-30 years, the human population is expected to grow by over 2 billion people. To combat the increase in food consumption that accompanies this population growth, food production must increase. An increase in inorganic fertilizer usage to aid food production will not be feasible as an excessive amount of fertilizer used on crops leads to a release of greenhouse gases which contribute negatively to climate change. To find an alternative to inorganic fertilizer usage, low-voltage electricity was applied to sub-irrigated plots of raphanus sativus and pisum sativum seeds. Electricity was applied to two plots of each seed: fifteen voltage treatment and thirty voltage treatment, through electrodes placed in the watering vessel. The plots were treated for thirty seconds each weekday with germination results recorded each day. After three weeks of growth, the plots were harvested, and height and mass were measured for each germinated plant. Chlorophyll from the leaves of each plot were also extracted and placed in a spectrophotometer with absorbance values being measured. Using statistical analysis of the data, an increase in mass from electrically treated plots compared to control plots can be seen to be statistically significant. This research can be used to cement low-voltage electricity as a viable alternative to inorganic fertilizers.

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