Accelerating Plant Growth With Electro–Horticulture

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Electro-horticulture, an intriguing and sustainable agricultural practice, can harness the power of electricity to stimulate plant growth. This research investigated the impact of electrical fields on the germination and development of Vigna angularis. Seeds were exposed to four voltages (1.5V, 3V, 6V, and 9V) and a control group without electrical stimulation. My hypothesis was applying 6V DC would yield the best results. Under controlled conditions, I monitored seed germination, leaf emergence, shoot and root development, fresh and dry weight, and chlorophyll content. Plants treated with 6V displayed the highest germination rate (100%), germinating 3 days earlier than the control group. Seedlings treated with 6V also exhibited the fastest primary and secondary leaf emergence, reaching maturity 4 and 5 days sooner than the control, respectively. Shoot and root lengths, alongside fresh and dry weight, were all maximized in the 6V group, showcasing enhanced growth and biomass production. Additionally, Chlorophyll content, crucial for photosynthesis, was highest in the 3V-6V group, suggesting improved photosynthetic efficiency. This study provides compelling evidence that low-level electrical stimulation enhances the growth and development of Vigna angularis. Notably, 6V DC stands out as the optimal voltage, promoting faster germination, increased biomass, and enhanced photosynthetic efficiency. By harnessing the power of electricity, we can not only boost crop yields but also reduce reliance on harmful chemicals. Exploring optimal techniques and the potential of electro-horticulture for larger-scale production, especially in vertical farming, can bring a greener, more sustainable future for agriculture, maximizing food production with minimal environmental impact.

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