Determining the Growth Rate of a Lima Bean Plant Through a Development on Hydroponics

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Several third-world countries and places on Earth have infertile soil for plant and crop growth. Hydroponics is the concept of growing plants without soil but with added nutrients. This experiment tested which "hydroponic" method would allow a Phaseolus lunatus lima bean plant to grow and which approach would render the most efficient growth rate. Six trials were conducted, consisting of Phaseolus lunatus seeds planted in four "hydroponic" methods: vermiculite, perlite, coconut coir, and cotton balls, all placed under a plant light. In this development on hydroponics, water enriched with additional nutrients was not added, hence the quotations. A control variable consisted of potting soil. Each day, plant height was measured. At the end of the experiment, the growth rate was calculated. After many days of collecting data (50+ days for trials 4-6, 90+ days for trials 1-3), calculations showed that cotton balls had an average growth rate of 1.9 cm per day, and the least efficient growth rate was vermiculite with 0.6 cm growth per day. All the soil substitutes facilitated germination and healthy growth for the bean plant. The study showed that cotton balls provided the fastest growth rate for the Phaseolus lunatus bean plants, supplying a quicker growth rate than the potting soil. This is a new contribution to horticulture: a discovery to the introduction that the Phaseolus lunatus plant doesn’t require extra nutrients added during growth, contrary to normal hydroponics, and proves maximal adaptability to survive and thrive in soil-less conditions.

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