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The Role of Nutrient Analysis in the Successful Cultivation of Cannabis

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Abstract: Proper nutrition is a key element to the successful cultivation of cannabis. Lighting, the soil microbiome, and numerous other environmental factors all play important roles in optimizing growth and yields of cannabis. However, without ideal fertilization, yields can fall dramatically short of optimized targets. Traditionally, symptoms have been identified through visual cues from the plant such as leaf yellowing, brown spots, etc.

Determining the elemental concentrations in plant tissue is done using inductively coupled plasma optical emission spectroscopy (ICP-OES) and combustion analysis. The major (N, P, K), secondary (Ca, Mg, S) and micro (Co, B, Mo, Mn, Zn, Cu, Fe) nutrients are determined by dry weight analysis. These values can be compared to target ranges and determination if the plant is deficient, sufficient, or contains toxic levels of target analytes. Consistent testing throughout the growing cycle helps to identify issues associated with each growing stage of the plant.

The objective of this study was to produce methods for plant tissue analysis that allowed for rapid turnaround times and accurate data. Timing is critical in the evaluation of plant tissue as it is key to identify deficiencies or toxicities prior to physical symptoms becoming present. The quality and yields of cannabis can be increased significantly through the use of plant tissue testing and corresponding adjustments to fertilizer programs.