A Study of the Effectiveness of Hydroponic Growing Variables on Lactuca sativa var. capitata

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Hydroponic growing in controlled environment horticulture has been an increasingly used method of produce production around the world. Its many methods integrate sustainability and growth efficiency through the control of climatic and system variables. A Study of the Effectiveness of Hydroponic Growing Variables on Lactuca sativa var. capitata investigated control variables that would produce and market a more effective lettuce crop. In the study, Experiment 1 looked at the correlation between hydroponic nutrient solution levels, plant tissue spectrometry analysis, and the consumer taste/recognition preference. The experiment was carried out by growing lettuce in different concentrations and seeing if consumers and ICP-spectrometry were able recognize differences in varieties of lettuce. Experiment 2 investigated the comparison between the dimensions of deep water culture systems and post harvest measurements. This test looked at post-harvest measurements of lettuce grown in different dimensioned sized deep water culture systems to understand which system would be most effective for lettuce growth. Through this study, it was found that spectrometry recognition of lettuce crops grown in different nutrient levels was effective with 7 of the 12 tested elemental nutrients showing sufficient results in the lettuce. Consumer identification recognition was not successful with 40% of consumers unable to recognize any nutrient level compared to two other lettuce varieties. The 14 gallon (102 x 50.8 x 66cm) size deep water culture system also produced lettuce with larger harvest-length. This research will impact future studies in effective hydroponic growing and growers looking to expand knowledge of beneficial growth.

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