

Comparison of the Carbon Partitioning and Photosynthetic Efficiency of Lettuce (*Lactuca sativa* L.) under Hydroponics and Soil Cultivation

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It is claimed that hydroponically grown plants are superior in yield and resistance to pests and diseases. Although these attributes are explained on the basis of the principles of plant physiology, no specific research has been done to understand the physiological basis of such statements. Moreover, result of many molecular biology related experiments conducted using hydroponics to reveal basic processes in plants have been generalized to soil grown plants assuming that plants behave in the same manner in both soil and hydroponic culture. Thus, it is necessary to investigate this issue for evidence to pursue further research. In this study, lettuce (*Lactuca sativa* L.) was grown in hydroponics and soil and a number of basic physiological parameters were measured for comparison. Hydroponically grown lettuce plants showed high shoot: root ratio, photosynthetic rates per unit leaf area and stomatal conductance compared to soil grown lettuce. Transpiration rates were higher in hydroponically grown plants due to higher stomatal conductance. Number of leaves was also 53% higher in hydroponically grown plants. Chlorophyll concentration data were not statistically significant. Mean harvest index of plants grown under hydroponics was also significantly higher than that of soil grown plants.

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