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Evaluation of the growth and quality of lettuce microgreens (*Lactuca sativa* L.) in the hydroponic system: A review

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Lettuce (*Lactuca sativa* L.) is one of the most popular vegetables, used especially in salads, consumed in ever increasing quantities as it is perceived as „healthier foods”. The parts most often used are leaves, but stems or seeds can also be used. Lettuce is cultivated for its head, which is usually consumed fresh, as different salads, and during the last years as microgreens (cotyledon phase). During this growing phase plants can be four up to 40 times more concentrated in beneficial nutrients, vitamins and minerals. Lettuce microgreens can provide higher amounts of phytonutrients (ascorbic acid, α -carotene, α -tocopherol, and phylloquinone) and minerals (Ca, Mg, Fe, Mn, Zn, Se, and Mo), compared with their mature-leaf counterparts. Lettuce has a high ecological plasticity, but, in spite of this, its phenotypic expression, morphology, physiology and anatomy are significantly influenced by environment conditions. The environment conditions which influence the development of lettuce microgreens in the hydroponic system are (average values): light (400 W), photoperiodicity (12 h), light intensity ($500 \mu\text{mol m}^{-2} \text{s}^{-1}$), color spectrum (440-460 nm), temperature ($20 \pm 2^\circ\text{C}$), humidity ($80 \pm 5\%$). Nutritional solution in the hydroponic system must be carefully monitored, by checking certain essential parameters such as (average values): pH (6.3 ± 0.4), electrical conductivity ($1.8 \pm 0.2 \text{ mS}$), dissolved oxygen (6 mgL^{-1}) and temperature ($18 \pm 2^\circ\text{C}$). From the analysis of expert literature, it results the need to set up certain cultivating protocols of microgreens in a hydroponic system to eliminate as many factors which can influence negatively plants, in order to obtain higher concentrations of active substances.

Biography

Prof. dr. Rusu Teodor from University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania, teach Agrotechnics, Experimental Techniques and Rural Development. Has worked as a soil pedologist for the 3 years, and agrotechnics for the last 25 years, specializing in soil monitoring, soil tillage, soil quality, minimum tillage, no-tillage, conservative agriculture, microgreens and climatic changes.

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