

Miyada Na-Ek 2011: Use of Perlite for Lettuce (*Lactuca sativa* L.) Grown in Soilless Culture. Master of Science (Environmental Science), Major Field: Environmental Science, College of Environment. Thesis Advisor: Associate Professor Sombun Techapinyawat, Ph.D. 124 pages.

From the past, expanded perlite has been used as a substrate for growing lettuce in soilless culture. However, the aim of this research work is to grow lettuce in nutrient solution along with perlite. Five weeks after the culture, there was the highest increase in the number of leaves, shoot length, stem diameter and in the whole plant fresh and dry weight by using 3:1 v/v of mixture between perlite 3.00 mm in diameter and cube vermiculite in Machlis and Torrey (1965). Different concentrations of N-NO_3^- and N-NH_4^+ in Machlis and Torrey as well as Enshi nutrient solutions were studied. The highest growth of shoot length, stem diameter, root length and whole plant fresh and dry weights of lettuce were obtained in Machlis and Torrey nutrient solution with 175 mg/l N-concentration, 21.19 cm, 24.10 cm, 13.63 cm, 64.44 g, and 3.31 g, respectively. Growth of lettuce in Machlis and Torrey nutrient solution with 175 mg/l N-concentration was repeatedly studied with different substrates. The highest number of leaves, shoot length, stem diameter, root length and whole plant fresh and dry weights were found in 3:1 v/v of mixture between perlite 3.00 mm in diameter and cube vermiculite, 16.50 leaves per plant, 18.40 cm, 17.50 cm, 14.50 cm, 35.92 and 3.65 g, respectively. The result indicated that 3:1 v/v of mixture between perlite 3.00 mm in diameter and cube vermiculite in Machlis and Torrey nutrient solution at the N-concentration 175 mg/l was the best substrate and nutrient for the growth of lettuce in soilless culture. However, growth of lettuce from this study is lower than that of previous studies.

Student's signature

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