Effect of particle size of perlite and its mixture with peat moss on essential oil percent and yield of lemon balm (*Melissa officinalis*) in hydroponic system

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Abstract

Type of growing medium affects growth of the hydroponic crops. In order to select a suitable medium for hydroponic lemon balm, two greenhouse experiments were carried out on growing media containing different particle sizes of perlite and peat moss mixed with perlite. In the first experiment, growing media treatments were very fine perlite (<0.5 mm), fine perlite (0.5-1 mm), medium perlite (1-1.5 mm), course perlite (1.5-2 mm) and very course perlite (>2 mm) as 100% by volume. Treatments of the second experiment were mixed grades of perlite with 50% peat moss and peat moss (100% V/V). The experiments were arranged in a randomized complete blocks design with three replications. Results showed that significant differences were observed in the measured parameters in inorganic substrates (perlite with different sizes), organic substrates (peat moss) and mixture of organic and inorganic substrates. The highest fresh weight (98 g), dry weight (29.5 g), and essential oil yield (0.13 g/pot) were obtained in the treatment with perlite size of 0.5-1 mm. In the mixture of perlite and peat moss media, the highest fresh weight (189 g) and dry weight (62.4 g) was obtained in the perlite size of 1-1.5 mm. The highest essential oil yield (0.28 g/pot) was observed in pure peat moss treatment. In general, it could be concluded that although addition of peat moss to perlite substrates increased growth parameters and yield of lemon balm, but the size of perlite should be considered in the preparation of growth medium.

Keywords: Medicinal plants, Organic substrate, Soilless culture.

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