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Evaluation of Locally Produced Composts in Sustainable Greenhouse Cultivation of Potted Medicinal Aromatic Plants

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Abstract

In the framework of sustainable cultivation, natural resources should be used rationally for the production of agricultural products of low environmental footprint. So, in the present study, three composts produced in Crete were evaluated in greenhouse cultivation of three Mediterranean medicinal aromatic plants, in comparison with two levels of fertilization, aiming to utilize biowaste and to reduce the use of fertilizers and water for irrigation. In the middle of May 2026, rooted cuttings of Thymus capitata, Satureja thymbra and Origanum majorana were planted in plastic pots, which contained 1.3 L of the following substrates: i) enriched peat-perlite 2:1 (v/v), ii) enriched peat-compost A (produced from olive pruning, supplied by the Laboratory of Natural Resources, Management and Agricultural Engineering of the Department of Agriculture, HMU, Heraklion, Greece)-perlite 1:1:1 (v/v), iii) enriched peat-compost B (produced from source segregated biowaste, supplied by DEDISA, Chania, Greece)-perlite 1:1:1 (v/v), and iv) enriched peat-compost C (produced from urban greenery pruning/ mulch, supplied by DEDISA, Chania, Greece)-perlite 1:1:1 (v/v). Six weeks after planting, monthly fertilization with the fertilizer BEST 20-20-20 (BESTAGRO, Athens, Greece), at half (0.75 g/L) and normal (1.5 g/L) concentration, was applied. The experiment lasted for totally 14 weeks. Each substrate was irrigated when the upper 2.0 cm of the substrate was dried (about 22–25% (v/v) substrate moisture content) and the dates of irrigation were recorded. The physicochemical properties of the composts and substrates, such as moisture (%), pH, electrical conductivity (EC), organic matter (%), organic carbon (%) on dry weight and nutrients' determination (N, P, K), were measured and were correlated with the growth measurements in plants, such as survival rate (%), plant height and diameter (cm), number of lateral shoots, which were recorded monthly, as well as fresh and dry weight of aboveground and underground part, which were recorded at the end of the experiment. Conclusions were drawn regarding the effect of each type of compost on the growth of each plant species and the reduction in the number of required irrigations throughout the growing season, as well as on the effectiveness of growth in the substrates with different types of compost compared to the two levels of fertilization.

Keywords: biowaste, mulch, Thymus capitata, Satureja thymbra, Origanum majorana