

Biochar additions in the growing media for the partial replacement of peat, for the production of potted snapdragon flowers

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Abstract

Biochar use as a component on peat-based growing media positively affects plant growth and yield. In the present study, a commercial grade biochar was used, derived from feedstock forest wood. Biochar was mixed in four different ratios (0-5-10-15-20%) with peat (P) and the potted snapdragon flower was used as the tested plant. Biochar material revealed high K levels and high pH of 9.56. Therefore, the increased rates of biochars in the substrate mixture increased the pH and affected the EC of the growing media. High ratio (15-20%) of Biochar affected a series of plant growth parameters: increased plant height, decreased the number of produced flowers and as a consequence resulted in similar plant weight, fresh and dry. Biochar of 10% decreased chlorophyll content and leaf chlorophyll fluorescence while chlorophyll a, total chlorophylls and carotenoids level were remained unaffected by the Biochar levels in the growing media. The addition of Biochars decreased N content in snapdragon leaves. Biochar at 5% ratio decreased K content in leaves in comparison to the control and/or higher Biochar levels. Total phenols and antioxidant capacity of the plant were also affected by the addition of Biochar. Mineral content in plants' leaves have been affected from the Biochar presence, as it was noticed that Na was highly accumulated in leaves. An increased stress is occurred when high ratio of Biochar is used (i.e. 20%), while lower ratio (5-10%) can benefit plant growth related parameters and can be used as peat additive in the growing media. Biochars is a quite promising material as a component in growing media mixtures.

Keywords: Biochar; peat; growth; snapdragon; *Antirrhinum majus*; seedlings

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