

Enhancing the sustainability of growing media: exploring pine bark as a perlite substitute in coir-based substrates for lettuce cultivation

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Increasing the sustainability of growing media constituents is currently a priority. This study aimed to evaluate whether pine bark can replace perlite in coir-based substrates. For this purpose, an experiment was carried out with four treatments: two coir-based mixes, one containing perlite and the other pine bark, and two electrical conductivities of nutrient solution (1.5 ± 0.2 and 2.5 ± 0.2 dS m⁻¹). Lettuce plants (*Lactuca sativa* L. cv. *Godzilla*) were grown in Styrofoam boxes filled with growing media containing, by volume, 80% coir, 12% compost, and 8% of either perlite or pine bark. The pine bark led to an increase in the electrical conductivity and bulk density of the mix. The presence of pine bark in the mix did not influence the effect of nutrient solution concentration on the average values of pH and electrical

conductivity of the leachate. The electrical conductivity of leachate increased with the nutrient solution ion concentration. The presence of pine bark in the mix did not affect the shoot nutrient content of N, P, K, Ca, and Mg. Shoot iron and boron content were higher in plants grown with pine bark-containing substrates. Shoot N and P increased with the increase in ion concentration in the nutrient solution. The presence of pine bark relative to perlite did not affect the influence of nutrient solution concentration on photosynthetic pigment contents, shoot dry weight, or yield (head fresh weight). This indicates the potential of pine bark as a sustainable alternative to perlite without compromising lettuce production.

Keywords: *Lactuca sativa* L, soilless media, sustainable substrates, electrical conductivity, Photosynthetic pigments