Use of black soldier fly (*Hermetia illucens* (L.), Diptera: Stratiomyidae) larvae processing residue in peat-based growing media

LeonardoSetti[a1] EnricoFrancia[ab] AndreaPulvirenti[ab] SilviaGigliano[b] MassimoZaccardelli[c] CatelloPane[c] FedericaCaradonia[b] SaraBortolini[ad] Lara Maistrello[ab] DomenicoRonga[ab1]

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Highlights

- Black soldier fly larvae processing residue is an alternative growing medium to peat.
- Black soldier fly larvae processing residue can be used in a proportion up to 20%.
- Black soldier fly larvae processing residue increase the growth of the potted plants.

Abstract

The Black Soldier Fly (*Hermetia illucens* (L.), Diptera: Stratiomyidae) is an insect whose larvae thrive on agro-industrial by-products. This study reports the first use of black soldier fly larvae processing residue (BSPR) as an innovative ingredient for growing media. BSPR was characterized and evaluated to partially replace commercial peat (CP) in the production of potted plants. Chemical and microbiological analysis showed the suitability of BSPR for soilless production. Hence, six growing media mixtures (CP 100% + slow acting synthetic solid fertilizer, CP 90% + BSPR 10%, CP 80% + BSPR 20%, CP 70% + BSPR 30%, CP 60% + BSPR 40% and CP 100% without fertilizer) were assessed for the production of baby leaf lettuce, basil and tomato potted plants. Using BSPR in a proportion up to 20%, all investigated crops showed values significantly greater than or comparable to those obtained using CP 100% + slow acting synthetic solid fertilizer. In general, BSPR used in a proportion up to 20% increased the crop growth of baby leaf lettuce, basil and tomato, recording a high total dry weight (+31%, compared to the total average) and the measured leaf parameters (+39% of leaf area, +14% of leaf number), without showing abiotic stresses. This study indicates that BSPR used in a proportion up to 20% might be a valid approach for soilless production of potted baby leaf lettuce, basil and tomato plants.