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Utilization of steam-exploded *Quercus mongolica* and micro-organism materials as components in soilless growth media for herbaceous and woody plants

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In Korea, many researchers are studying methods to transition from cultivating plants in soil to growing them in growth media. Peat, the most widely used component of growth media, is obtained from wetland, which are being rapidly depleted; this has caused environmental concern, leading many countries to limit the permissible extent of peat mining, and peat prices are rising as a result. The aim of this study was to investigate the possibility of using steam-exploded oak wood chips (SEOW) and a *Bacillus subtillis* mixture (BSM) as component of growth media. The soilless growth medium was composed of peat, SEOW and BSM (3:3:4, w/w/w). Herbaceous (*Festuca arundinacea*) and woody (*Lespedeza cyrtobotrya* Miq.) plants were planted in soil and in the soilless growth medium. Using natural soil as the control, we increased the proportion of the soilless growth medium to 25%, 50%, and 75%, and then to 100% of the growth substrate. Physical and chemical properties of the soilless growth medium were determined, and experiments were conducted to measure growth parameters such as seed germination, root length and stem length. We determined that, overall the soilless growth medium led to higher porosity and water-holding capacity and lower bulk density, pH, EC and inorganic compound content than those of the control soil. Seed germination and root length were highest in 100% soilless growth medium condition. In contrast, stem length was similar when using control soil and in all of the soilless growth medium conditions. In conclusion, soilless growth medium led to better seed germination and root length than did control soil. Therefore, SEOW and BSM appear to be feasible as alternatives to peat in growth medium. Furthermore, future research should be conducted to determine the optimum use of soilless growth medium for a variety of plants.

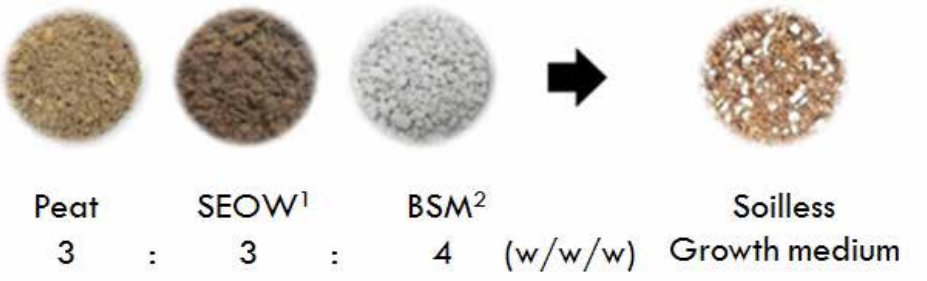

Fig. 1. Production of soilless growth media
[1]: Steam-exploded oak wood chips
[2]: *Bacillus subtillis* mixture

Biography

Jai Hyun Park is a Master's candidate at Gyeongsang National University (South Korea). He is studying on growth media for growing various plants. He is interested in biomass and bio-ethanol production.

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