A study on the physical and hydraulic characteristics of cocopeat perlite mixture as a growing media in containerized plant production

ABSTRACT

A well-known planting medium in soilless culture is a coconut based material famously known in Malaysia as cocopeat. It is a viable ecologically friendly peat soil substitute for containerized crop production. The multipurpose growing media had received much interest particularly in commercial applications. This study focused on the physical and hydraulic characteristics of cocopeat perlite mixture as a growing media in containerized plant production. Perlite was added to cocopeat at a ratio of 3 cocopeat: 1 perlite. Bulk density, particle density, porosity, particle size distribution, water holding capacity, wettability and hydraulic conductivity of the media were evaluated. About 82.93% of the total particles were in the range between 0.425 and 4 mm in diameter at a bulk density of 0.09 g/cm3. Total porosity (79%) and wettability improved with the incorporation of perlite to cocopeat. This study showed that water holding capacity was very high at 912.54% whereas the saturated hydraulic conductivity was low at 0.1 cm/s. The results showed that adding perlite to cocopeat had improved the physical and hydraulic characteristics of the media.

Keyword: Bulk density; Cocopeat; Hydraulic conductivity; Perlite; Water holding capacity