

EFFECTS OF PALM KERNEL BIOCHAR AND FOOD WASTE COMPOST ON THE GROWTH OF PALM LILY (*CORDYLIN FRUTICOSA*), COLEUS (*COLEUS SP.*), AND BOAT LILY (*RHOEO DISCOLOR*)

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Abstract. In recent years, soil amendments have been widely used in agriculture to improve the soil quality, plant production and quality, and reduce the fertilizer usage. Thus, current study was carried out to investigate the effects of palm kernel biochar and food waste compost on soil properties, plant growth performance and physiological responses of *Cordyline fruticosa*, *Coleus* sp., and *Rhoeo discolor*. These plants were arranged in a randomized complete block design (RCBD) with eight treatments; control (T1), fertilizer (T2), food waste compost (T3), compost + < 20% of fertilizers (T4), biochar (T5), biochar + < 20% of fertilizers (T6), biochar + compost (T7), biochar + compost + < 20% of fertilizers (T8), with four replicates. The application of food waste compost and biochar in *Coleus* sp. showed the best performance concerning plant growth including the plant height (65.75 cm), the number of leaves (59), chlorophyll contents (29.70 $\mu\text{mol}/\text{m}^2$), photosynthetic rate (23.53 $\mu\text{mol CO}_2 \text{ s}^{-1}$), stomatal conductance (0.009 $\text{mmol m}^{-2} \text{ s}^{-1}$), transpiration rate (0.269 $\text{mmol m}^{-2} \text{ s}^{-1}$), water use efficiency (WUE) (88) and total biomass (62.50 g). It can be concluded that the addition of compost and biochar as a soil amendment can improve soil fertility and plant growth performance.

Keywords: *soil amendment, landscape plant, reduce, fertilizer, nursery*

Introduction

Soil amendment is an addition of material to the soil which helps improve physical and chemical properties such as increasing soil aggregate stability, improve soil pH, nutrient content in soil and improve aeration and drainage in soil (Shainberg et al., 1990). In recent years, soil amendments have been widely used in agriculture development to improve the soil quality, increase crop yield and plant growth performance (Chan et al., 2008). The use of agricultural wastes as soil amendments also has received attention in recent years for agronomic application (McGeehan, 2012). Biochar and compost are organic agricultural waste that undergo a transformation that facilitates their use as soil amendments. These soil amendments provide benefits most people especially farmers where the application enable them to reduce the fertilizer usage which is harmful to the environment.

Biochar technology are a technology to boost agricultural production and at the same time helps to preserve the environment (Montanarella and Lugato, 2013). Biochar is a