

Effects of Organic Amendments Produced from Agro-Wastes on Sandy Soil Properties and Black Pepper Morpho-Physiology and Yield

ABSTRACT

Sandy textured soil infertility poses a problem for sustainable crop cultivation. This problem is usually dealt with by the addition of chemical fertilizers, which are expensive and can cause serious environmental issues if not managed well. A better alternative to improve and manage sandy soil infertility is the use of organic amendments produced from agro-wastes. This two (2)-year field study was conducted in a sandy-textured soil grown with black pepper to evaluate mainly the effects of chemical fertilizer, fermented plant and fruit juices, compost, and biochar on soil properties and morpho-physiological characteristics and yield of black pepper. Generally, the results indicated that the combination of fermented fruit juice, compost, and biochar was comparable to and in some cases better than chemical fertilizer in terms of soil physical, chemical, and biological properties as well as crop performance. These findings were even more pronounced in the second year of measurements. There were strong positive relationships between soil N and pepper leaf chlorophyll content and between soil microbes and soil respiration. The findings showed that these soil amendments produced from agro-wastes are a good alternative to the use of chemical fertilizers on sandy soils to improve soil fertility and productivity and the yield of black pepper sustainably.