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## EFFECT OF CATTLE MANURE, COIR DUST AND PADDY HUSK ASH ON PHYSICAL AND CHEMICAL PROPERTIES OF POTTING MEDIA

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### ABSTRACT

An experiment was carried out at the Agronomy farm of the Eastern University, Sri Lanka to study the effect of organic manures on physical and chemical properties of media used in pot culture technique. Three different types of organic manures (cattle manure, coir dust and paddy husk ash) were tested and soil type used for this experiment is sandy regosol. The experiment was laid out in a Complete Randomized Design (CRD) with five treatments and four replications. Different types of potting media were prepared by mixing of potting materials at different ratio (v/v) such as such as medium 1 (T<sub>1</sub>) used as control contained sandy soil only, medium - 2 (T<sub>2</sub>) contained sandy soil: cattle manure at ratio of 3:1, medium - 3 (T<sub>3</sub>) contained sandy soil: cattle manure: coir dust at ratio of 6:2:1, medium - 4 (T<sub>4</sub>) contained sandy soil: cattle manure: paddy husk ash at ratio of 6:2:1 and medium - 5 (T<sub>5</sub>) contained sandy soil: cattle manure: coir dust: paddy husk ash at ratio of 12:4:1:1. Soil testing was done in two stages the day on media preparation and four weeks after media preparation. Disturbed soil sample was collected from each medium and its both physical and chemical properties were estimated. The results indicated that organic manures have significant effect on the properties of potting media. Addition of organic manures resulted in the improvement of physical properties such as water holding capacity, particle density, bulk density and porosity and chemical properties such as pH, nutrients content (P and K), organic matter content and electrical conductivity of potting media. Among tested materials, paddy husk ash increased pH and nutrients content (P and K) of media distinctly and improved other properties such water holding capacity, electrical conductivity and porosity to optimum level. Medium (T<sub>4</sub>) contained sandy soil, cattle manure and paddy husk ash at ratio of 6:2:1 showed highest soil pH (7.4), P content (77 mg/kg) and K content (88 mg/kg). Usage of paddy husk ash as a potting material with sandy soil and cattle manure for media preparation in pot culture technique would improve both physical and chemical properties of medium and provide favourable condition for root establishment and crop growth.

### INTRODUCTION

Soil is the key component of natural ecosystem because environment sustainability depends largely on sustainable soil eco system (Adedokun *et al.*, 2007 and Adenipekun, 2008). Increasing food production is closely related with the productivity of soil. This productivity of soil in turns can be enhanced by improving soil properties. Organic matter influences the physical, chemical and biological properties of soil. It has nutritional function in that it serves as a source of N, P and K for plant growth, a biological function in that profoundly affects the activity of microflora and macroflora organism and physical function in that it promotes good soil structure, thereby improving tilth, aeration and retention of moisture. Soil organic matter also improves the chemical properties of soil such as cation exchange capacity and buffer action.

Pot culture technique is one of the recent method to control the environment for maximizing crop productivity and increasing the quality of vegetable produces. Pot technique is an open system of vegetable cultivation; crops are grown in pots or poly bags. Potting medium depends on the crop requirement and the medium should provide suitable condition for the crop growth. Mixture of organic manures with soil is a good medium for cultivating vegetable crops. Organic manures serve as food for soil organism from bacteria to worms (Stephens *et al.*, 1994). These organisms hold onto nutrients and release them in the available form to plants. In addition to N, P and K, manures can be a source of sulphur and micronutrients. Manures improve the structure of soil in potting medium, these structural improvement increases the amount of water useful to crops that soils can hold, improve aeration and drainage and also encourage good root growth by

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