LAND HUSBANDRY: THE EFFECT OF CHICKEN MANURE AND CORN COB BIOCHAR ON SOIL FERTILITY AND CROP YIELD ON INTERCROPPING PLANTING PATTERN OF CASSAVA AND CORN

Yuniwati, E. D.
Agriculture Faculty, Wisnuwardhana University, Malang
Corresponding author : should be addressed to email: nieyuniwati@wisnuwardhana.ac.id and nieyuniwati@gmail.com

ABSTRACT

The use of chicken manure and corn cob Biochar is proven to be able to improve soil quality, plant growth crop yield of cassava and corn. This study also aims to show that different types of biochar applications (chicken manure and corncob biochar) are able to improve soil physical and chemical properties, the yield of cassava and corn kernels biomass.This study was conducted in a farmer field in Batu, about 15 km southeast of Malang, East Java, Indonesia. The study was conducted on alfisol land having 8% surface slope. The method used was 1) field experiment using Randomized Block Design (RBD) with the following treatment: 1. Monoculture (without soil enhancer, M). 2) Monoculture with Chicken Biochar Pump (MMcB), 3. Monoculture with Corncob Biochar (MCcB), 4. Intercropping of cassava and corn (CS), 5. Intercropping of cassava and corn with chicken manure biochar (CSMcB), 6. Intercropping of cassava and corn with Corn Cobs biochar (CSCcB). The observations included measurements of plant height, soil sampling for observation of soil physical and chemical properties and crop yield of cassava and corn kernels. The results showed that biochar application can improve soil quality, physical and chemical properties of soil, and crop yield on intercropping system. The management of plants in land husbandry becomes a symbiotic mutualism between cassava and corn. C organic soil, total pore, drainage, water availability and soil aggregate stability increased after being treated using chicken manure biochar (MMcB). The increase on pH and N, P, K, Ca, Mg and cation exchange capacity showed good soil quality in MMcB treatment, and CSMcB treatment on intercropping planting pattern. After harvesting the corn, the chemical properties of soil after being treated using biochar has increased in term of its high pH into 6.26, 0.14% nitrogen content , 6.13 ppm P content, 0.26 (me / 100g) K content, 12.7 KTK , 2.38 (cmol / 100g) Ca, and 1.40 (cmo / / 100 g) Mg. The application of both chicken manure and corn cob biochar is proven to be able to improve yield of cassava and corn both in monoculture system and intercropping. The highest yield of cassava is obtained from monoculture planting system with chicken manure biochar (MMcB) for 33,14 ton / ha and intercropping of chicken manure biochar (CSMcB) for 30.16 ton / ha, and corn seed yield for 4.89 ton / ha

Keywords: Biochar, chicken manure, corncobs, soil fertility, crop yield, intercropping pattern.