

ABSTRACT

STUDY OF CONSERVATION TILLAGE SYSTEM AND LONG TERM NITROGEN FERTILIZATION FOR THE SOIL BIOMASS CARBON MICROORGANISM (C-MIC) AND CORN (*Zea mays* L.) PRODUCTION IN ULTISOL SOIL

By

ADITYA KIRANA

Indonesia is an agricultural country who most of people work as farmers. One of the most important process in planting is a soil tillage. For the short term, intensive tillage can improve soil physical problem, but in the long term can cause damage to the soil. To reduce the negative impact need to implement soil conservation tillage systems. Soil conservation tillage system is a system of land preparation that aims to prepare the land for crops to grow and produce optimum, but still concern for soil and water conservation. Nutrient of nitrogen is the most important element for plants, except that the N element is also required for soil microorganism in order to continue activity.

This study aims to determine biomass carbon microorganism (C-mic) and corn productivity in three kinds of soil tillage system (Intensive tillage, Minimum tillage, and No tillage) and long term nitrogen fertilization effect.

This research by using a randomized block design (RAK) and arranged in a factorial (3x3) with 4 replications. The first factor in this research is the treatment of tillage system (T), namely T_1 = intensive tillage, T_2 = minimum tillage, T_3 = no tillage, and the second factor in this study were long-term nitrogen fertilization (N), N_0 = 0 kg N ha⁻¹, N_1 = 100 kg N ha⁻¹ and N_2 = 200 kg N ha⁻¹. The soil samples were taken at three points of each plot at the one day before processing of land and when corn reached maximum vegetative. The result were tested for the homogeneity by Bartlett test, aditifity test by Tukey test, and then analysis of variety, and continued with Honestly Significant Difference test 5% and correlation test between N fertilizer and C-Mic, Production, and C-mic with corn production.

The results showed that overall of Intensive Tillage, Minimum Tillage, and No Tillage did not significantly increase biomass carbon of microorganism (C-mic) and corn production. N fertilization 200 kg N ha⁻¹ significantly increased biomass

Aditya Kirana

carbon microorganism during the vegetative plant corn, but not significant at the time before tillage and significantly affected for crop production. There was no interaction between soil tillage system with N fertilization to increase biomass carbon of microorganism and corn production.

Keywords: Conservation tillage systems, N fertilization, soil microorganism biomass, corn production.