

Jeerawan Promma 2011: Response to Type and Rate of Soil Amendments by Cassava Grown on Yasothon Soil. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Assistant Professor Somchai Anusontrpornperm, Ph.D. 107 pages.

Two years experiment was conducted in farmer field at Ban Kud Muang, Takhian sub district, Dan Khun Thot district, Nakhon Ratchasima province from April 2009 to May 2011 to investigate the response to type and rate of soil conditioners by cassava grown on Yasothon soil (Typic Paleustult). Randomized Complete Block design was employed with four replications. There were 13 treatments comprising no soil amendment, applications of chicken manure at the rates of 1,000, 2,000 and 3,000 kg rai⁻¹, gypsum, grinded limestone, and dolomite lime, each soil amendment applied at the rates of 100, 200 and 300 kg rai⁻¹. All soil amendments were applied before planting in the first and second year of the study. All treatments received equally split application of complete fertilizer (15-15-15) at the rate of 100 kg rai⁻¹ applied at one- and three-month after planting. Young mature leaves (the fifth fully expanded leaf from the tip) were sampled at four month of age for the analysis of nutrients concentration. Soil samples were collected at one month before harvesting for examining the effect of soil amendments on the change of soil properties. Cassava was harvested at ten months old. Above ground biomass, fresh tuber weight, number of tuber per plant, and starch percentage were recorded.

Results revealed that application of soil amendments facilitated the increase of cassava fresh tuber yield, number of tuber per plant and starch percentage. The impact was more obvious in the second year of the experiment when the use of all soil conditioners statistically highly significantly increased the yield. Application of gypsum at the rate of 100 kg rai⁻¹ gave the highest fresh tuber yield of 4.29 tonne rai⁻¹ while the addition at higher rates (200 and 300 kg rai⁻¹) showed indifferent yield compared to the yield obtained from the control treatment without using soil amendment. Moreover, the yield tended to decrease with increasing rates of gypsum applied. Use of grinded limestone and dolomite lime at the rate of 300 kg rai⁻¹ also gave the high fresh tuber yield of 4.28 and 4.11 tonne rai⁻¹, respectively. However, addition of both soil conditioners at the lower rates (100 and 200 kg rai⁻¹) still tended to increase fresh tuber yield with the range obtained between 3.27-4.00 tonne rai⁻¹. Addition of chicken manure induced cassava to significantly produce more of above ground biomass than did other soil conditioners. The use of grinded limestone and dolomite lime helped raise soil pH and reduced bulk density but these changed soil properties had no relationship with fresh tuber and starch yields. Soil amendments had no effect on nutrients concentration in cassava leaf. The application of soil conditioner for cassava grown on Yasothon soil should be carried out for at least two consecutive years, considering the yield retrieved from this experiment. Type of soil conditioner should be considered based on the cost per unit and workability in the field

Student's signature

Thesis Advisor's signature