Nipat Thanimmarn 2011: Use of Perlite, Chicken Manure and Zn Foliar Application for Improving Yield of Cassava Grown on Yasothon Soil. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Assistant Professor Somchai Anusontpornperm, Ph.D. 96 pages.

An experiment was carried out in the farmer field at Ban Kud Muang, Takhian sub district, Dan Khun Thot district, Nakhon Ratchasima province to study the effect of perlite, chicken manure and zinc foliar application on yield and concentration of nutrients in leaf of cassava grown on Yasothon soil (Typic Paleustult). Factorial in Randomized Complete Block design with four replications was employed. The first factor consisted of no soil amendment, application of 500 kg chicken manure per rai, 100 kg perlite per rai and 500 kg chicken manure + 100 kg perlite per rai. The second factor comprised no foliar application, $ZnSO_4$ foliar application at the rates of 3 kg rai^{-1} applied at 1-month old (one time), and the same rate for each application at 1-, 2- and 3-month old (three times). All plots were added with 15-15-15 fertilizer at the rate of 100 kg rai^{-1} (split into equal amount and applied twice at 1- and 3-month old). Soil samples were collected for examining the change of soil properties as affected by soil amendments. Cassava leaf was collected at 4-month old for nutrients concentration analysis and cassava yield and parameter involved were harvested and recorded at 10 months of age.

It was found that application of chicken manure gave the highest fresh tuber yield of 3.59 tonnes rai^{-1}, which was statistically indifferent from additions of perlite, and perlite plus chicken manure but significantly greater than the treatment with no addition of soil amendment (2.87 tonnes rai^{-1}). Plant survival rate had the same trend as of fresh tuber yield. In addition, chicken manure application also had clear effect on the increase of aboveground biomass. Use of perlite together with chicken manure tended to give the highest starch yield of 919.1 kg rai^{-1}. Zinc foliar application (three times) was likely to offer the highest fresh tuber yield of 3.51 tonnes rai^{-1} and it resulted in significantly higher starch percentage (26.9%), starch yield (955.8 kg rai^{-1}) and survival rate (90%) than those without Zn application. However, the interaction between soil amendment and zinc on plant performance was barely clear. Addition of chicken manure with three times Zn foliar application tended to give the highest fresh tuber and starch yields of 3.88 tonne $rai^{-1}$and 1,046.3 kg rai^{-1}, respectively.

A single Zn foliar application at one month after planting induced the highest amount of P concentration (3.1 g kg^{-1}) in cassava leaf. The use of perlite enhanced the highest concentration of K in cassava leaf with the value of 12.7 g kg^{-1} and chicken manuring gave significantly higher concentration of Mg in cassava leaf (8.9 g kg^{-1}). Applying chicken manure together with perlite increased available phosphorus content left in the soil and tended to lower soil bulk density and increase hydraulic conductivity.

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