

Sirinthra Tasarika 2010: Response of Cassava Grown on Coarse-textured Soils to Fe and Zn Foliar Application and Chicken Manure. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Assistant Professor Somchai Anusontpornperm, Ph.D. 98 pages.

Two similar trials were conducted on Warin (Arenic Haplustult) and Yasothon (Typic Paleustult) soils in farmer fields located in Nakhon Ratchasima province, aiming at determining tuber yield and nutrient concentration in leaves of cassava in response to foliar application of Zn and Fe and chicken manuring. Experimental design of the trials was 6X2 Factorial in Randomized Complete Block. The first factor employed no chicken manuring and application of 500 kg rai⁻¹ chicken manure while second factor comprising the control treatment: no foliar application, treatments 2-4: one, two and three times foliar application of 3 kg ZnSO₄ per rai when cassava was one, one and two, one, two and three-month old, and treatments 5 and 6: one and two times foliar application of 3 kg ZnSO₄+0.8 FeSO₄ per rai when cassava was one, one and two-month old. Complete fertilizer (15-15-15) at the rate of 50 kg rai⁻¹ was applied twice at one and three months after planting. Leaf samples were collected at the age of three and six-month old while tuber yield were harvested at 10 month old.

Result showed that chicken manuring gave fresh tuber yield of 5.58 tonne rai⁻¹ which was highly significantly higher than the other without the application of this manure (4.98 tonne rai⁻¹) in the case of Warin soil but there was no statistical difference in the other soil. The chicken manure also effected the greater amounts of stem, above ground biomass and starch content than that of the one without the application of chicken manure when grown in both soils. In both soils, foliar application had no effect on tuber yield and other parameters determined. Three times Zn foliar fertilization with chicken manure incorporated into the soil before planting tentatively gave the highest yield of 6.06 tonne rai⁻¹ when grown in Warin soil whereas in the other soil, the highest tuber yield of 3.21 tonne rai⁻¹ was obtained from the treatment with single Zn foliar application plus the incorporation of chicken manure into the soil before planting. In the case of Warin soil, addition of chicken manure resulted in significantly higher K concentration in three and six months old leaves than those without manuring but for Yasothon soil, there was only three months old samples that K concentration was statistically higher in the case of chicken manure application than in the other without chicken manuring. Zinc and Fe foliar application had no effect on the concentration of Zn and Fe in leaves at the age of three months when grown in Warin soil but the increase of Zn concentration responded to Zn foliar application at three months of age in Yasothon soil. Three times Zn foliar application with chicken manuring induced 61.9 mg kg⁻¹ Zn and 1.13% K concentrations in six months old leaves which were statistically higher than other treatments in Warin soil, whereas, in the case of Yasothon soil, chicken manuring could induce the highest Zn concentration (75.35 mg kg⁻¹) in leaves at the same age. Cassava gave the highest tuber yield with the amounts of 38.12-43.99 and 33.52-51.80 mg kg⁻¹ of Zn and Fe concentrated in three-month old leaves when grown in Warin and Yasothon soils, respectively.

Student's signature

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