

Nitsara Jongwang 2013: Response of Chili Pepper Grown on Nam Pong Soil Series (Grossarenic Haplustalfs) to K Fertilizer Rates. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Assistant Professor Saowanuch Tawornpreuk, Ph.D. 64 pages.

Response of Chili pepper grown on Nam Pong soil series (Grossarenic Haplustalfs) to K fertilizer rates carried out using the K fertilizer requirement equation. A study on Buffer Coefficient for Potassium (BC_K), a principle parameter of the equation, of six soil series which were Chatturat, Lop Buri, Teparak, Non Thai, Nong Kung and Nam Pong as widely soil distributed in the study area. After getting the BC_K correlated it to some soil properties. The investigation was conducted in 2 experiments. The first experiment was studied in laboratory by incubating soil with various KH_2PO_4 concentrations included 0, 60, 90, 120 and 240 $mg\ kg^{-1}$. After incubating for 14 days, potassium in the incubated soils was extracted by NH_4OAc (pH 7.0) and Mehlich-1 extraction methods. The result revealed that the BC_K values were different between the extraction methods which the BC_K extracted by NH_4OAc (pH 7.0) was relatively higher than Mehlich-1. The correlation between BC_K with some soil properties by using stepwise multiple regression found that BC_K values by NH_4OAc (pH 7.0) had relationship with soil pH (pH), which BC_{KNH_4OAc} (pH 7.0) = $1.492 - 0.1118pH$ ($R^2=0.501$) and BC_K values by Mehlich-1 correlation with exchangeable Mg (Mg) as $BC_{KMehlich-1} = 0.792 - 0.0006Mg$ ($R^2=0.627$). The second experiment was plot experiment for site specific of K fertilizer rate on Nam Pong soil series using Randomize Complete Block Design (RCBD) with 6 treatments and 4 replications at the rates of K fertilizer of 0, 5, 10, 15, 20 and 30 $kg\ K_2O\ rai^{-1}$. All of treatments applied N fertilizer of 24 $kg\ N\ rai^{-1}$, and P fertilizer of 30 $kg\ P_2O_5\ rai^{-1}$. The result of this experiment examined that the application of 15 $kg\ K_2O\ rai^{-1}$ tended to produce the highest fresh fruit yield of 674 $kg\ rai^{-1}$ at significantly different. For the application of 30 $kg\ K_2O\ rai^{-1}$ was highest potassium uptake in above ground biomass (10.9 $kg\ rai^{-1}$) at significantly different.

The K fertilizer rate prediction using K fertilizer recommendation equation suggested that for obtaining highest yield corresponded to plot experiment the predicted K-fertilizer application rate were 18.94 and 18.28 $kg\ K_2O\ rai^{-1}$ by NH_4OAc (pH 7.0) and Mehlich-1, respectively which closer application rate in the plot experiment than that of the K fertilizer recommendation equation. Then increasing K-fertilizer rate application greater than 13.5 $kg\ K_2O\ rai^{-1}$ in the model found that the predicted yield was obviously higher than the actual yield.

Student's signature

Thesis Advisor's signature