

Netirat Chumsuvan 2012: Plant Nutrients Limiting Growth and Yield of Tainan 9 Peanut Grown in Sakon Nakhon Province. Master of Science (Agronomy), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Associate Professor Juangjun Duangpatra, Ph.D. 130 pages.

Two sets of pot in greenhouse and field trials of Tainan-9 peanut were carried out in two soils of great groups number 40 and 49, whereby each soil sample of which for pot experiment was collected from each of the two villages in Sakon Nakhon province namely Ban Kuakhankaen, Tonpung, Phangkon and Ban Neguyai, Aumjan, Kusumarn. Pot experiments were designed as RCB 14 nutrient omission treatments including nutrient completion and the control in each replication. The objectives of the two pot trials in two separate village's soils were to investigate the availability status in soils of 12 plant's essential elements : N P K Ca Mg S Fe Mn Zn Cu and Mo. Subsequently, two field experiments were also conducted in each corresponding village's soil in order to study the response of peanut to various rates of N and K as well as the interaction among the major elements. Collected data for pot and field experiments were consisted of crop growth, yield components and pod yield of peanuts.

The results of pot trial using soil sample collected from Ban Kuakhankaen revealed that this soil are obviously deficient in B and K and also tended to response markedly to N and Zn. Moreover, the N and K additions – field trial that followed at the same site where the soil samples were collected also showed comparable response to N and K applications. The appropriate treatment combinations of N and K rates for further recommendation to farmer comprised the use of N and K at 3 kgN/rai and 6 kgK₂O/rai because this N and K treatment gave the highest yield and net income per rai as compared to other treatments. Pot trial and subsequent field experiment using soil samples from and the same field site at Ban Neguyai also showed similar trend of response to various plant nutrient additions i.e the results of pot trial indicated that Ban Neguyai's soil was K deficient and also was likely to deficient more or less in N, S, Zn, B and Mo. Additionally, peanut experimented under field conditions also gave pronounced responses to N and K additions. Apparently, the optimal treatment combinations of N and K rates for further dissemination to the farmers comprised the uses of N and K at 4.5 kgN/rai and 9.0 kgK₂O/rai because this treatment produced the highest yield and net income per rai as compared to other treatments.

Student's signature

Thesis Advisor's signature