

Determining Optimum Rates of Mineral Fertilizers for Economic Rice Grain Yields under the “Sawah” System in Ghana

Buri Mohammed Moro*, Issaka Roland Nuhu¹ and Wakatsuki Toshiyuki²

¹*CSIR-Soil Research Institute, Academy Post Office, Kwadaso, Kumasi, Ghana*

²*Faculty of Agriculture, Kinki University, Nara 631 - 8505, Japan*

**Corresponding author*

Abstract

Nutrient input and output balances are very essential for maintaining balances in not only soil nutrient management but also in preventing pollution and waste through excess use. A study was undertaken to determine the optimum levels of the major elements (N, P, K) required for optimum lowland rice yields under the “sawah” system within the Biem and Dwinyan watersheds of the Ashanti Region, Ghana. Results show that the sites suffer multinutrient (N, P, K) deficiencies, with N and P being more pronounced. Mineral fertilizer positively and significantly affected rice paddy grain yield. The addition of 30 kg/ha each of N, P₂O₅ and K₂O increased mean paddy grain yield by 71%, 51% and 56%, respectively. The application of higher rates of N (> 90 kg/ha) did not reflect in yield improvement and, therefore, was not economically beneficial. Optimum grain yield was observed at 60 kg P₂O₅/ha and 60 kg K₂O/ha. Site significantly affected grain yield only in the first year. Maximum economic grain yields were observed from the rates 90-60-90 and 90-90-60 kg/ha N - P₂O₅ - K₂O, respectively. From the results obtained, 90-60-60 kg/ha N- P₂O₅ - K₂O is recommended for these areas.