



Tropentag, September 11-13, 2024, hybrid conference

“Exploring opportunities ...  
for managing natural resources and a better life for all”

## The potential use of diatomaceous earth for improvement of paddy rice production in Thailand

FAPAILIN CHAIWAN, NATCHANON SANTASUP, CHOOCHARD SANTASUP

*Chiang Mai University, Dept. of Plant and Soil Sciences, Thailand*

### Abstract

This experiment was carried out to evaluate the effects of diatomite in combination with chemical fertilisers on the growth and yield of paddy rice, Niew San-Pah-Thong 1 (Thailand variety). The experimental design was a randomised complete block design (RCBD) with 3 replications and 6 treatments, as follows: (1) control (without diatomite and chemical fertiliser application) (2) diatomite application at the rate of  $18.00 \text{ kg ha}^{-1}$ ; (3) application of chemical fertiliser at the recommended rate in Thailand ( $\text{N:P}_2\text{O}_5:\text{K}_2\text{O} = 1.14:1.36:0.24 \text{ kg ha}^{-1}$ ) (4) application of diatomite ( $18.00 \text{ kg ha}^{-1}$ ) in combination with chemical fertiliser (5) application of diatomite ( $18.00 \text{ kg ha}^{-1}$ ) in combination with 75 % of chemical fertiliser; and (6) application of diatomite ( $112 \text{ kg ha}^{-1}$ ) in combination with 50 % of chemical fertiliser. Plant height and plant numbers per tiller were measured at 20, 30, 40, and 50 DAT (days after transplanting). SPAD and primary nutrients (nitrogen, phosphorus, and potassium) in rice leaf were analysed at 60 DAT. At the harvest stage (120 DAT), grain yield, yield components, and primary nutrients in the seed were determined. The results showed that application of diatomite in combination with different rates of chemical fertilisers did not significantly affect rice growth (plant height, plant numbers per tiller), SPAD, primary nutrients in rice leaves, and yield of rice. But when diatomite was used with different amounts of chemical fertilisers, the plants grew taller than treatment 3 (which used chemical fertiliser at the recommended rate). The highest rice yield ( $156 \text{ kg ha}^{-1}$ ) was achieved when diatomite was applied in combination with 50 % chemical fertilisers (treatment 6). Therefore, we selected the application of diatomite at a rate of  $18.00 \text{ kg ha}^{-1}$  as the recommended fertiliser programme for Niew San-Pah-Tawng 1 cultivation due to the low rate of fertiliser application and the high growth and yield obtained. Moreover, the low amount of fertiliser applied indicated the high efficiency of fertiliser usage and the reduction of chemical fertiliser residues in the soil.

**Keywords:** Rice, diatomite, chemical fertiliser