

ABSTRACT

Nano technologically synthesized materials are used in the modern agricultural system expecting many objectives such as improving the crop yield, quality and pest and diseases tolerance with minimum environmental pollution. Nano calcium carbonate (NCC) is once such nano material recently introduced and used as foliar fertilizer in some countries.

Once NCC enter into leaves it breaks down to CO₂ and CaO. Then the higher CO₂ concentration enhances photosynthesis and reduces transpiration due to stomatal closer. In Sri Lankan context research on effect of NCC has not been conducted. Therefore this study was conducted to investigate the effect of application of NCC as a foliar fertilizer under different soil fertilizer levels on yield, yield component and quality of rice.

Experiments were conducted at the Rice Research Station, Ambalantota in 2015/16. Split plot design was used for both field and pot trials with 3 and 5 replicates respectively. Four NCC levels (0, 50, 100 and 150 ppm) and 3 soil fertilizer levels (recommended level and 25% less and greater than recommended levels) were used.

Various growth, yield, quality parameters and insect resistant were collected from seedling stage to harvesting. Data revealed that the application of NCC as a foliar fertilizer can increases growth, yield, quality and insect resistivity or controlling of rice. In field experiment 100 ppm treated plants gave 2 tons/ha more yield than untreated plants, under recommended soil fertilizer level. NCC alone showed remarkable enhancement on growth parameters such as leaf area, chlorophyll content, number of tillers per plant, panicle length.

Overall result demonstrated that NCC has particular contribution to the improvement of rice growth yield, some quality parameters and insect resistivity. Therefore, foliar application of NCC could be recommended for sustainable rice production under Sri Lanka contest. However further research with different varieties, concentrations, application methods and climatic conditions should be conducted.

Out of four NCC levels highest performance were observed in 100 ppm NCC level for majority of parameters collected. Highest insect resistivity was observed in 150ppm level.

Key words: rice, nano calcium carbonate, soil fertilizer, yield, quality parameters, growth parameters, insect resistivity.