

ABSTRACT

Fertilizer Use in Cabbage (*Brassica oleracea* var. *capitata* L.) with special reference to urea-N

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The effects of $(\text{NH}_2)_2\text{CO-N}$ and other nutrients on the growth and yield of cabbage (*Brassica oleracea* var. *capitata* L.) were investigated in field and greenhouse studies on the River Estate soil series (Fluventic Eutropepts), (Smith, 1983), in the wet and dry seasons.

In the field studies, dry matter (DM) yields, fresh head yields (FHY) and other head yield components were determined, while in the greenhouse study parameters investigated included the soil reaction, soil exchangeable $\text{NH}_4\text{-N}$ and soil $\text{NO}_3\text{-N}$ levels, shoot and root DM yields, shoot tissue N, P, K and Mg concentrations, the presence or absence of cabbage heads, nutrient deficiencies and free $(\text{NH}_2)_2\text{CO}$ under three N carriers at two levels of applied N.

The wet season field study showed that high N rates (100 kg N/ha and 200 kg N/ha) produced lower DM yields than the control (0 kg N/ha). The dry season field study showed similar trends in the first three harvests; the FHY and the DM yields for the various N rates were increased considerably by allowing the crop to be harvested at 140 days after planting (DAP). The 200 kg N/ha treatment produced the highest total DM yield and FHY when compared to the control. In the greenhouse study, the $(\text{NH}_4)_2\text{SO}_4$ treatment gave the most significant drop in soil pH, the highest soil exchangeable $\text{NH}_4\text{-N}$ and with the $\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ treatment gave

the lowest shoot and root DM yields. The $(\text{NH}_2)_2\text{CO}$ treatment gave the highest shoot and root DM yield.

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The field studies indicated that the high $(\text{NH}_2)_2\text{CO-N}$ rates may have produced by-products such as $\text{NH}_3\text{-N}$ which, together with high soil pH generally reported subsequent to hydrolysis, would have had deleterious and suppressive effects on the cabbage plant growth and yield during the period of fertilization. Addition of N at 100 and 200 kg N/ha produced a substantially larger crop, but delayed maturity to 140 DAP. Addition of Mg and K did not significantly increase DM yield while P should not be applied at levels greater than 30 kg P_2O_5 /ha.

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