The effect of liming on crop yield, uptake of added nitrogen and some soil chemical properties.

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Abstract:

Experimental studios were conducted on Iwo soil series (pH 3.5-4.5) to determine the influence of liming on crop yield, uptake of added nitrogen and some soil chemical properties. Of the four liming materials i.e., calcium hydroxide, calcium carbonate, calcium magnesium carbonate and weed ash, calcium hydroxide gave the highest and the most stable pH increase.

Soil re-acidification was least with the addition of calcium ammonium nitrate as N-source than adding either urea or ammonium sulphate. In the lima requirement study, the quantities of liming material needed to bring the soil pH from 4.0 to 5.0; 6.0; 6.5 and 7.0 units, were 1.66; 2.49; 3.32 and 4.14 metric tonnes Ca(OH)₂ per hectare soil respectively.

A greenhouse study showed that the highest dry matter yield of maize was obtained at a pH value of 5.2 with 50ppm N addition while that of tomato was at pH of 6.0 with the same level of N-addition. Tomato plant showed a greater sensitivity to soil acidity than maize.

In the field, both liming and N⁻-addition increased the fruit yield of tomato, with the highest yield occuring at a pH of 7.0 with 80kg/ha N -addition.

Uptake of N by tomato was increased by both lime and N-application. Increased fruit yield of tomato from the limed plots was due, among others, to the increase in C.E.C. and % B.S.; reduction in the levels of the toxic micro-nutrients i.e., Mn, Fe and Cu, and % aluminium Saturation. Optimal growth of maize may be obtained at a pH of 5.0 to 6.0 and tomato at a pH of 6.0 to 7.0 with adequate N-applications.

Keywords: Liming/ plants/ weed/ soil/ acidification/ fertilizer

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