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Abstract:	Red and lateritic soils (Alfisol) of eastern India have problems of low available P, S, B & Ca especially in uplands & medium lands due to soil acidity , poor organic matter content , coarse texture , low base saturation. In continuously cropped areas, secondary and micronutrients deficiencies are being reported from many areas primarily due to their non-application in soil. Cropping , fertilizer use, amendments , organic manures, residue incorporation significantly affects the secondary & micronutrients availability in soil. The present study was under taken to assess the status of acid soils for Ca, Mg, S, B & other micro- nutrients as affected by different inputs in three long term experiments, e.g. Permanent Manurial Trial(started in 1956), Long Term Fertilizer Experiment(started in 1972) and Residue incorporation Experiment(started in 1991).Detailed study on the effect of fertilizer use, liming, organic manuring and crop residue incorporation on soil health and crop yields reveal : * Effect of fertilizer use - Use of N or NP fertilizers resulted in reduction of soil pH, organic carbon, available P & K status of acid soil. It also reduced Exch. Ca, S, B and Zn status of soil. Increasing the dose of fertilizers from 50 to 100 or 150% in acid soil resulted in reduction of soil pH, increase in available P, K and exch. Ca status. Exchangeable Mg, available S and B in soil decreased with increasing dose of fertilizer. Yield of maize & crop uptake of P, K, Ca, Mg, S & B increased in the order NPK > NP >N. Increasing the dose of fertilizers from 50 to 150% in soybean resulted in higher uptake of S, B, K and Ca. However yield of soybean crop & uptake of P & Mg was unaffected with increase in fertilizer dose from 100 to 150%. * Effect of Liming in acid soil - NPK + Lime increased soil pH & exchangeable Ca but reduced exch. Mg, available S & B, DTPA extractable Fe, Mn and Cu as compared to NPK application in acid soil. Liming reduced DTPA ext. Pb, Ni Co in acid soil. * Effect of organic manuring - NPK + FYM did not raise the soil pH in acid soil as compared to NPK application. NPK + FYM increased soil organic carbon, available K, exch. Mg & available B & reduced DTPA ext. Pb & Ni as compared to NPK application.NPK + FYM as compared to NPK increased grain yield of soybean with higher uptake of P, K, Mg S & Boron * Effect of residue incorporation - Residue incorporation in acid soil with NPK fertilizers raised soil pH, available P & K & S status. However, exch. Ca & Mg & available B content of soil was not affected when compared to NPK application alone. Residue incorporation with NPK fertilizers increased crop yield of maize & wheat as compared to NPK alone. Uptake of P, K, Ca, Mg, S & B by maize – wheat sequence in acid soil increased with in-situ incorporation of crop residues with NPK fertilizers as compared to application of NPK alone. Based on the above findings, it can be concluded that imbalanced use of plant nutrients such as N(-PK) or NP(-K) results in lower availability of plant nutrients such as P, K, exch. Ca, S, B & Zn. Nutrient application beyond the recommended level in acid soils adversely affects soil pH and decrease the availability of Mg, S & B in acid soil. Liming with NPK application improves crop yield & plant nutrient uptake with reduction in available Pb, Ni & Co content in acid soil. Organic manuring with NPK application was beneficial in acid soil. Residue incorporation with NPK fertilizers increased yield of maize & wheat & increased the uptake of secondary (Ca, Mg,S) & micronutrient (B) deficient in acid soil.
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