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Abstract: Litchi is one of the important subtropical fruit crops in the state of Jharkhand, occupying around 3.3 thousand hectare and production is about 16.5 thousand metric tonnes. Systematic research on fertilizer management programme based on soil and plant analysis is lacking in this crop. Plant analysis is ideally suited to evaluate nutritional needs in perennial crops. Ideally, fertilization program can be monitored by sampling leaves at any time for making fertilizer adjustment. Considering the importance of plant analysis in fruit crops, the present investigation was carried out in an established orchard (since, 1979) at ICAR Research Complex for Eastern Region, Ranchi Centre to study the nutrient concentration in leaves and soils of Litchi as well as interrelationship between available nutrients, total nutrient concentration present in soil and leaf with crop productivity for developing a sound fertilizer management programme. Collection of soil and leaf samples from established orchard was done during the 2006-07, analysis of soil and leaf samples for macronutrients (N, P, K, Ca, Mg and S) and micronutrients in soil and plant (leaf) part was carried out. Leaf concentration of N, P and K varied from 1.08 to 1.20, 0.081 to 0.109 and 0.690 to 0.786 percent, respectively. However, mean leaf nutrient concentration was 1.14, 0.095 and 0.738 percent for N, P and K, respectively. Highest concentration of N was observed for the 2nd pair of leaves where as for P and K was 1st pair of leaves. Soil content for N, P and K varied from 194 to 269, 20 to 85 and 325 to 515 kg ha⁻¹, respectively. However, mean soil nutrient content was 232, 53 and 420 kg ha⁻¹ for N, P and K, respectively. Highest content of N and K was observed at full canopy distance where as for P was 1/3rd and 2/3rd canopy distance. The concentration of secondary nutrients varied from 0.099 to 0.225, 0.050 to 0.114 and 0.070 to 0.076 percent for Ca, Mg and S, respectively. However, mean leaf nutrient concentration was 0.162, 0.082 and 0.073 percent for Ca, Mg and S, respectively. Highest concentration of Ca, Mg and S was observed for the 4th pair of leaves. Soil content for Ca, Mg and S varied from 1.20 to 1.83 cmol (p+) kg⁻¹, 0.71 to 1.50 cmol (p+) kg⁻¹ and 6 to 39 ppm, respectively. However, mean soil nutrient content was 1.52 cmol (p+) kg⁻¹, 1.11 cmol (p+) kg⁻¹ and 23 ppm for Ca, Mg and S, respectively. Highest content of Ca and Mg was observed 1/3rd canopy distance where as for S was 2/3rd canopy distance. Concentration of Cu, Fe, Mn and Zn in leaf varied from 4 to 21, 192 to 614, 75 to 175 and 15 to 35 ppm, respectively. However, mean leaf nutrient concentration was 12.5, 403, 125 and 25 ppm for Cu, Fe, Mn and Zn, respectively. Highest concentration of Cu and Mn was observed for the 1st pair of leaves where as Fe for 2nd pair of leaves. Highest Zn concentration was observed for both 2nd and 4th pair of leaves. Soil content for Cu, Fe, Mn and Zn varied from 0.71 to 1.35, 33 to 72, 50 to 80 and 1.16 to 1.68 ppm, respectively. However, mean soil nutrient content was 1.03, 53, 65 and 1.42 ppm for Cu, Fe, Mn and Zn, respectively. Highest content of Fe was observed for 2/3rd canopy distance where as Cu for 1/3rd canopy distance. Highest Mn content was observed for both 2/3rd and full canopy distance where as Zn content had no significant difference among the canopy distance. The ratio was 13.4: 1.0: 10.0 for N: P: K (primary nutrients), 2.0: 1.0: 0.8 for Ca: Mg: S (secondary nutrient) and 61.9: 10.0: 1.3: 1.0 for Fe: Mn: Zn: Cu (micro-nutrient). The work on validation for different varieties i.e. purbi, bedana, kasava and shahi was performed during the year 2007-08 and it was observed that the temporal and axial variability in different cultivars for primary nutrients (N, P and K), secondary nutrients (Ca, Mg and S) and micro nutrients (Fe, Cu, Mn and Zn) corroborated with the studies done during 2006-07. Significant negative relationship between yield and concentration were observed in 2nd and 4th pair of leaves. Soil sampling at 2/3rd canopy distance from the trunk was observed to be ideal for soil analysis.

Description: Leaf Analysis for Nutrient Diagnosis, Recommendation and Management in Litchi (Litchi Chinensis Sonn.)

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