

Estimation of carbon stored in plant biomass and quantification of macronutrient contents (N, P, K, Ca, Mg) in plant tissue in coffee plantations in Cerrado Mineiro

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Rationale

The objective was to evaluate the stocks of carbon and macronutrients (N, P, K, Ca and Mg) in the biomass of coffee plants at different stages of development in Minas Gerais.

Methods

Plants were uprooted for later separation and individual quantification of the biomass. Samples were dried in an oven to obtain the dry mass content and submitted for determination of C, N, P, K, Ca, Mg contents. Based on the results of dry plant material mass and element content, the stocks of each element in the biomass were calculated.

Results

The results demonstrated that the accumulation of plant biomass occurred in a logarithmic way, with intensive growth in the first years of cultivation and stabilization after 10 years. C is the most abundant element in plant biomass, approximately 50% of the total dry mass. Nutrients presented concentrations following the order N>K>Ca>Mg>P. Most nutrients, especially those mobile ones in the plant, were found in higher concentrations in the most active compartments, such as leaves and fruits.

Conclusions & Perspectives

One must highlight the importance of considering studies aimed at quantifying the C levels and nutrients in plant biomass, since the information generated allows estimating the ability of coffee plants to temporarily immobilize CO₂ in the form of biomass and consequently contribute to the environment. In addition, quantifying nutrients allows for identifying the amount of nutrients exported annually via fruit, helping to manage fertility in coffee production areas.

References

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