

Nutrient Accumulation in Leaves, Branches and Reproductive Organs of *Coffea Canephora* Genotypes in Three Phenophases

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Introduction

Throughout the phenological cycle, nutrients are redistributed among plant organs. In Conilon coffee, for example, nitrogen and potassium levels decline in leaves during the reproductive stage, while phosphorus concentrations remain higher in leaves than in fruits [1]. In fertigated coffee plantations, micronutrient levels peak during plant growth and anthesis, decrease during fruit development, and rise again as fruits begin to mature [2]. Thus, assessing the nutritional status of coffee genotypes across different phenophases is essential for optimizing fertilization.

Materials/Methods

Throughout the phenological cycle, nutrients are redistributed among plant organs. The leaves, branches, and flowers/fruits were evaluated in the genotypes Pirata, A1, Verdim TA, Clementino, and K61 during three phenophases, namely: flowering, fruit development, and fruit ripening. The collected and duly identified plant material was dried to constant weight in a forced-air circulation oven at 65°C. To determine the concentration of nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sulfur (S), iron (Fe), zinc (Zn), copper (Cu), manganese (Mn) and boron (B), the methodology of Silva et al. (2009) was used. Nutrients were distributed among plant organs. In Conilon coffee, for example, nitrogen and potassium levels decline in leaves during the reproductive stage, while phosphorus concentrations remain higher in leaves than in fruits [1]. In fertigated coffee plantations, micronutrient levels peak during plant growth and anthesis, decrease during fruit development, and rise again as fruits begin to mature [2]. Thus, assessing the nutritional status of coffee genotypes across different phenophases is essential for optimizing fertilization.

Results/Discussion

Significant differences regarding leaf nutrient concentrations were detected by the F-test ($p < 0.05$) among genotypes across the three phenophases evaluated. Some exceptions were observed, such as Mg, Fe, and B during flowering; N and K during fruit development; and Fe and Cu during ripening. Clementino and Pirata genotypes stand out with high concentrations of various nutrients in different organs and phenophases. Nutrient concentrations were highest during flowering and decreased during fruit development and ripening.

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Conclusion/Perspectives

The concentrations of the N, K and Fe were the highest in all phenophases and plant organs. For an accurate nutritional diagnosis for conilon coffee cultivation, the genotype-specific characteristics must be taken into consideration

References:

- Oliosi et al. 2020. Seasonal variation in leaf nutrient concentration of conilon coffee genotypes. *J Plant Nutrit*, 44, 74-85.
Neto et al, 2011. Changes of nutritional status during a phenological cycle of coffee under high nitrogen supply by fertigation. *Commun Soil Sci Plant Anal*, 42, 2414-2425.

N, P and Fe > K, Ca, Mg, S, Zn, Cu, Mn, B

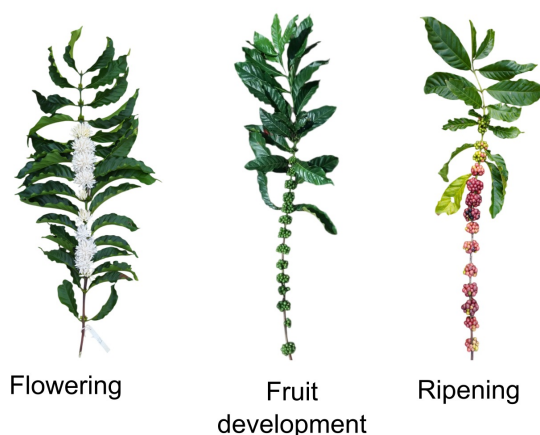


Figure 1. Leaves, branches and reproductive organs of *C. canephora* genotypes in three phenophases: flowering, fruit development and ripening