

Introduction

Coffee growing in the Western Amazon has undergone changes at the technological level, leading the state of Rondônia to second in the ranking of *Coffea canephora* production in Brazil. Although the *C. canephora* species carries genes for resistance to the main pathogens that affect coffee plants, studies show that there are different levels of resistance among the genotypes. In this regard, the identification of coffee plants with higher number of resistance alleles for the main diseases is essential to the Amazonian coffee sustainability to these diseases.

Materials/Methods

In our work, 96 *C. canephora* plants (Fig. 1) were analyzed with molecular markers associated with resistance genes to *Hemileia vastatrix* (coffee leaf rust) and *Colletotrichum kahawae* (coffee berry disease - CBD). Of these coffee plants, 59 belong to the breeding program of the Brazilian Agricultural Research Corporation (Embrapa) in Rondônia. The other 37 genotypes come from selection carried out by local producers. Purified DNAs from coffee plants were analyzed with five different loci associated with *H. vastatrix* resistance, and one locus monitored by two markers flanking the gene associated with *C. kahawae* resistance



Figure 1: Analyzed canephora coffee plants

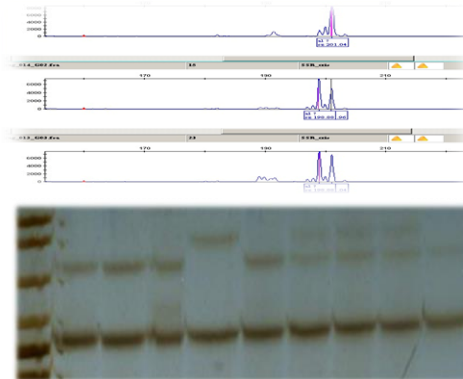


Figure 2: Marker Assisted Selection for coffee leaf rust and coffee berry disease.

Results/Discussion

Molecular data (Fig. 2) allowed identifying coffee plants containing resistance alleles for both diseases, with emphasis on coffee plants Clone N13, Clone N02 and Hybrid 16 BAG. These coffee have four pyramidal alleles for resistance to *H. vastatrix* and the allele for resistance to *C. kahawae*. We also found coffee genotype with the S_H3 gene, the only one that has not yet been supplanted by the *H. vastatrix* races in Brazil. Furthermore, coffee plants with the *C. kahawae* resistance gene can be selected for a preventive CBD breeding program. The use of these molecular markers was efficient to identify coffee plants that present pyramided resistance alleles for both pathogens. When a genotype has pyramided resistance alleles, it increases performance stability in the environment

Conclusion/Perspectives

Some Amazonian Robusta genotypes have the potential for durable resistance to the main coffee diseases, since the pathogens may not be able to overcome their pyramids of resistance genes.

References:

- Saavedra, L. M., Caixeta, E. T., Barka, G. D., Borém, A., et al. (2023). Marker-Assisted Recurrent Selection for Pyramiding Leaf Rust and Coffee Berry Disease Resistance Alleles in *Coffea arabica* L. *Genes*, 14(1), 189.
- Gonzales, R. V., Zambolim, L., Almeida, D. P., Caixeta, E. T. et al. (2023). Prospects for achieving multiple disease resistance with *Coffea canephora* clones. *Australasian Plant Pathology*, 1-12.