

# Simultaneous resistance to the nematodes *Meloidogyne paranaensis* and *M. incognita* in Arabica coffee progenies with *Coffea canephora* introgression

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## Introduction

The nematodes *Meloidogyne paranaensis* (MP) and *M. incognita* (MI) cause significant damage to coffee crops worldwide. The use of resistant cultivars is the most effective control method. There are few arabica coffee cultivars with resistance to these nematodes. IDR-Paraná has several progenies with potential resistance to these nematodes, although they have not been evaluated yet. The aim of this study was to evaluate the resistance to MP and MI in these progenies.

## Materials/Methods

Two experiments were conducted in greenhouse conditions at the Instituto de Desenvolvimento Rural do Paraná (IDR-Paraná) in Londrina, Paraná, Brazil – one for MP and another for MI. A completely randomized design was used with 12 replications and one plant per plot. Twelve F7 progenies from “Icatu IAC 925” × “Sarchimor IAC 1669-33” were evaluated for each nematode. The susceptible control was ‘Mundo Novo IAC 376-4’. Seedlings were inoculated with 1,000 individuals (initial population – Pi) of MP and MI. Evaluations were performed 120 days after inoculation, processing the roots to obtain the final population (Pf) of MP and MI and the number of nematodes per gram of root (NGR)[1]. The reproduction factor (RF) was calculated using the formula  $RF = Pf / Pi$ . Plants with RF lower than 1.0 were considered resistant. The percentage of resistant plants in each progeny was also calculated.



## Results/Discussion

The susceptible control showed an average RF of 40.22 and NGR of 7,075.29 for MP and RF of 48.78 and NGR of 3,897.64 for MI, confirming both susceptibility and inoculum viability. Among the progenies, nine showed simultaneous resistance to both nematodes, with RF values ranging from 0.03 to 0.86 for MP and 0.19 to 0.96 for MI. Three progenies had 100% resistant plants for MP, and only one for MI. Progeny 7 stood out, with an RF of 0.05, NGR of 26.96, and 100% resistant plants for MP, and an RF of 0.34, NGR of 20.77, and 91.67% resistant plants for MI.



## Conclusion/Perspectives

Progeny 7 will be self-pollinated to establish an F8 seed field. In another study, this progeny also exhibited high productivity, a medium-early ripening cycle, and resistance to coffee leaf rust (CLR). This progeny is being developed as a new cultivar by IDR-Paraná, and it is expected to have a major impact on coffee cultivation. Currently, only the IPR 100 and IPR 106 cultivars have shown simultaneous resistance to MP and MI, but they are susceptible to CLR and have a very late ripening cycle.

## References:

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