Interaction of *Radopholus similis* and *Fusarium oxysporum* f. sp. *cubense* in banana

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Introduction & Objectives

- Interaction between plant-parasitic nematodes and soilborne plant pathogens can result in additive effects against the host.
- It has been hypothesized that *Radopholus similis* infection might increase Fusarium wilt severity (caused by *Fusarium oxysporum* f. sp. *cubense*).
- The aim of this study was to determine the interaction between both pathogens, on Fusarium wilt severity and plant growth.

Materials & methods

- *Gros Michel and Grand Nain tissue-culture banana plantlets were inoculated with R. similis* and Foc, Race 1.
- External symptoms and growth parameters were weekly evaluated for 8 weeks.
- Fresh weight and internal symptoms of Fusarium wilt were assessed at the end of the experiment.
- Experiment was established in a completely randomized design. Data were subjected to analysis of variance (ANOVA) with the INFOSTAT software, version 2013.

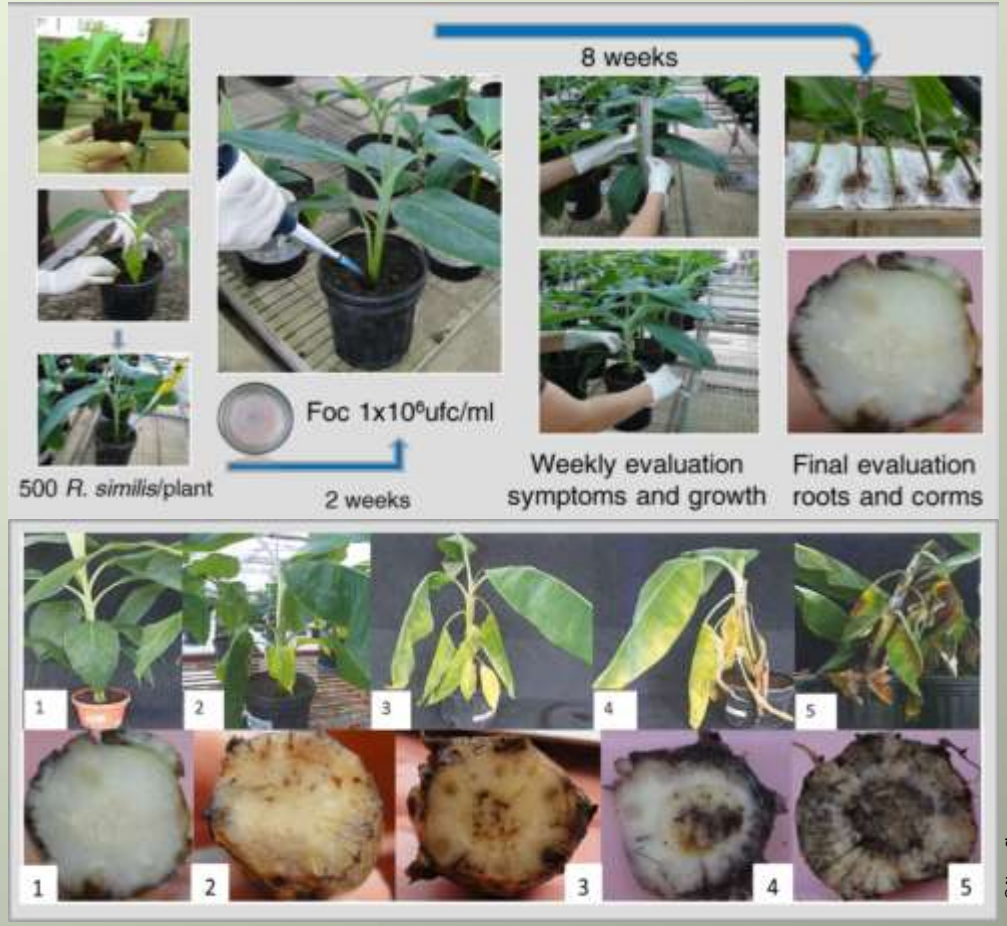

Fig. 1. Protocol for inoculation (upper panel) and scale for evaluation of symptoms of Fusarium wilt in banana under greenhouse conditions.

Results

- Incubation period and disease severity showed no significant difference in Gros Michel with or without *R. similis*.
- Co-infection hardly affect the plant root system in both cultivars.
- Grand Nain plants were severely affected by *R. similis* with any symptoms of Fusarium wilt.
- Grand Nain banana plants had higher growth in the presence of Foc compared to control plants.

Table 1. Plant growth and Fusarium wilt severity in banana plants , with and without *Radopholus similis*

Treatment	Height (cm)	Diameter (mm)	Number of leaves	External Symptoms	Internal Symptoms	Root weight	Leaf weight (g)	Plant weight
Gran Enano Control	11.70 a	6.03 bc	8 ab	1 b	1 b	13.90 ef	57.10 e	71.00 de
Gran Enano+*R.similis*	7.80 b	4.86 bc	8 ab	1 b	1 b	8.92 f	60.31 de	62.31 e
Gran Enano+Foc+*R.similis*	12.35 a	8.08 a	9 a	1 b	1 b	12.65 f	85.12 cd	97.77 cd
Gran Enano+Foc	10.25 ab	6.74 ab	8 ab	1 b	1 b	20.95 de	93.36 c	114.31 c
Gros Michel Control	7.50 b	5.88 bc	8 ab	1 b	1 b	52.68 a	169.48 a	222.16 a
Gros Michel+*R.similis*	10.55 ab	4.91 bc	7 b	1 b	1 b	32.42 bc	175.20 a	207.62 a
Gros Michel+Foc+*R.similis*	7.30 b	4.79 bc	6 c	2.7 a	2.9 a	26.57 cd	132.40 b	158.97 b
Gros Michel+Foc	2.70 c	4.71 c	6 c	2.4 a	2.6 a	39.49 b	131.62 b	171.11 b

Conclusions

- *R*. *similis* has not effect on Fusarium wilt severity in Gros Michel banana.
- Co-infection of Foc and R. similis affect dramatically the plant root system.
- Resistance of Grand Nain to Fusarium wilt was not affected by high inoculum pressure of *R*. *similis*.
- The Foc race 1 isolate used on this study seems to be growth promoting in Grand Nain. Additional studies are under-going to verify this hypothesis .

References

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