TITLE*:* BIOLOGICAL CONTROL OF *FUSARIUM SOLANI*

AUTHORS: AZEVEDO, P. F.; ALMEIDA, A. C.; COSTA, C, L.; LESCANO, L. E. A. M.; MATSUMOTO, L. S.

INSTITUTION: UNIVERSIDADE ESTADUAL DO NORTE DO PARANÁ *CAMPUS* LUIZ MENEGHEL, BANDEIRANTES, PR (RODOVIA BR 369, KM 54, CEP 86 360-000, BANDEIRANTES, PR, BRAZIL)

ABSTRACT:

Cassava root rot causes significant production losses. Difficulties of management, along with the lack of chemical fungicides officially registered by the Ministry of Agriculture, Livestock and Supply (MAPA), require alternative control methods. This study investigated the *in vitro* antagonistic activity of *Trichodermaharzianum* and of biological fertilizer MICROGEO® on *Fusariumsolani* and described the main mechanisms involved in the biocontrol of the fungus. *F.solani* (strains F1 and F2) were isolated from rotted cassava tubers and *T. harzianum*, strain ESALQ 1306, from a biological fungicide. Continuous liquid composting of bovine ruminal content and water with the component MICROGEO® produced the biological fertilizer. For the bioassay with *T. harzianum,* the dual culture method was applied. Sterilized biological fertilizer (St) was tested as: St1 (control), St2 (2.5%), St3 (5.0%), St4 (10.0%), St5 (20.0%), and St6 (40.0%), and unsterilized fertilizer (USt) as: USt1 (control), USt2 (0.3125%), USt3 (0.625%), USt4 (1.25%), USt5 (2.5%), USt6 (5.0%), USt7 (10.0%), USt8 (20.0%), and USt9 (40.0%), by dilution in the culture media. The fungi were grown at 25 °C, with a photoperiod of 12 h for 7 days. The mycelial growth was evaluated by daily measurements of the colony diameters, to establish the mycelial growth velocity index (MGVI) in mm day^{-1}, as well as the inhibition percentage, aside from the sporulation rate and spore germination percentage. The bioassays were arranged in a completely randomized design and the results subjected to analysis of variance. The means from the bioassay with *T. harzianum* were compared by the t test ($p < 0.05$). Regression analysis and Tukey's test ($p < 0.05$) were applied to the data of the bioassay with biological fertilizer. The mycelial growth of *F. solani* isolates in dual culture with *T. harzianum*wasinterrupted after hyphae encounter, due to the occurrence of mycoparasitism, but without influence on the sporulation rate. Sterilized biological fertilizer induced no biocontrol, whereas the unsterilized product (USt5: 2.5%) inhibited approximately 64% and 85%, respectively, of the mycelial growth of isolates F1 and F2. Moreover, spore germination declined with increasing product concentration. The compounds resulting from the microbial metabolism of the biological fertilizer were essential for the inhibitory effect. It was concluded that the proposed control alternatives were effective for *in vitro*biocontrol of *F. solani*.

Keywords: biocontrol, biofertilizer, mycoparasitism, *Fusarium* root rot

Development Agency: CAPES, CNPq