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Farmers’ and academia’s views”

Diversity and management of parasitic nematodes associated with *Fusarium* wilt disease on cotton in Benin

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Abstract

Plant-parasitic nematodes cause an estimated \$80 billion in yield losses annually worldwide in various crops among which cotton. The reniform nematode *Rotylenchulus reniformis* Linford and Oliveira, for example, not only reduces seed cotton yields but also depreciates the quality of the fiber and seed reducing yield from 15 to 75 % depending on infestation levels and weather conditions. The damages of nematodes are usually followed by pathogens infestation such as of *Fusarium oxysporum* f.sp. *vasinfectum* leading to a complex disease development. In Benin, *Fusarium* disease was reported in 2021 with enormous damage (up to 70 % of lost) in cotton fields. But till now, no comprehensive studies have been yet done on parasitic cotton nematodes and their interaction with wilt disease caused by *F. oxysporum* in Benin, although such studies are essential for proper management. The main objective of this study is to reduce yield losses caused by *Fusarium*-nematodes complex disease on cotton using environmentally-friendly and sustainable methods. Specifically, this study will: 1) determine cotton producers’ knowledge of cotton wilt, nematodes and methods used to manage them; 2) establish the diversity and distribution of cotton parasitic nematodes in Benin; 3) develop integrated management methods using the combined amendment to soil of biochar, cow dung and poultry manure for plant parasitic nematodes and *F. oxysporum* associated with nematodes in complex diseases. Thus, the expected results of this research project are: 1) the knowledge of cotton producers on wilt, nematodes and their management method is known; 2) the map of the diversity and distribution of cotton nematodes in Benin is established; 3) the sanitary status of cotton fields due to the damage caused by the interaction between nematodes and the *Fusarium* is known; 4) an integrated method of control of cotton nematodes, *Fusarium* and the complex disease is developed. Thus, for agriculture in general, this research project will contribute to a better valorisation of crop residues (by the manufacture of biochar), the management of plant pests by inexpensive and environmentally friendly methods, thus preserving the health of producers and allowing at the same time a better crop production.

Keywords: Benin, cotton, *Fusarium oxysporum*, management, nematode