SOIL MANAGEMENT AS AN EFFECTIVE STRATEGY FOR CROP DISEASE MANAGEMENT: THE CASE OF PANAMA DISEASE IN BANANA

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Crop diseases are an important threat to food security. Crop disease management includes a range of different options, such as breeding for resistance, which is attractive but relatively slow, and chemical control, which may be effective but can have adverse environmental impacts. There is an increased awareness that optimal crop disease management is a combination of different approaches. An option that receives relatively little attention is soil management, which may influence disease incidence. The effects of soil abiotic factors such as pH and N-content on the incidence of diseases in different crops have been reported. In this study we test the hypothesis that optimal soil conditions may help to suppress the predisposition of banana to Panama disease (a soil born fungal disease caused by Fusarium oxysporum f.sp. cubense). Although deficiencies can predispose the plant to present diseases, an excessive level of nutrients can also influence disease incidence or severity. In order to validate the model, we tested the effect of soil pH and nitrogen level on Panama disease in greenhouse trials. Inoculated and non-inoculated banana plants were planted in a soil with two pH and three nitrogen levels. Low pH and nitrogen levels showed a significant higher incidence of Panama disease. Results show that soil abiotic factors do contribute to disease management in crops. Besides, practices as liming to increase the soil pH should be tested as an option to slow down the incidence and reduce the severity of Panama disease in infested areas. Also the application of adequate doses of N contributes to disease management. In field and on-farm trials are planned to substantiate these data demonstrating the role of soil abiotic factors on Panama disease incidence and severity in banana.