SOUTH AFRICAN AVOCADO ORCHARDS FACE THREAT FROM WHITE ROOT ROT PATHOGEN

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INTRODUCTION

A recent study from the Avocado Research Programme, published in the European Journal of Plant Pathology, has investigated the presence and prevalence of the pathogen *Dematophora necatrix*, formerly known as *Rosellinia necatrix*, in South African avocado orchards [1]. This pathogen, known for causing white root rot (WRR), was first discovered in South African avocado orchards in 2016 [2]. This pathogen has the tendency to persist in the environment and poses a serious threat to the agricultural and forestry industries due to its destructive impact on several plant host species.

The 2022 study, led by Jesse Hartley, Juanita Engelbrecht, and Noëlani van den Berg, not only surveyed the prevalence of *D. necatrix* but also significantly improved methods for its detection and isolation from samples collected in the field. By employing both morphological and molecular techniques, the team successfully identified the pathogen in diseased plant material and soil samples from the provinces of Limpopo, Mpumalanga, and KwaZulu-Natal.

In their quest for improved detection, the researchers developed a semi-selective medium that incorporates Rose Bengal, nystatin, cycloheximide, chlorothalonil, and 2-phenylphenol. This medium allows researchers to isolate the slow-growing *D. necatrix* from samples which contain numerous other microorganisms. Furthermore, the team utilized a *D. necatrix*-specific TaqMan qPCR protocol, which demonstrated a high detection rate of 91.3% in artificially infected roots and 100% in artificially inoculated soil. When applied to naturally infected plant and soil samples, the presence of *D. necatrix* was confirmed in 86% and 70% of the samples, respectively.

The economic significance of the South African avocado industry cannot be overstated, with approximately 14,700 hectares dedicated to avocado production. The study's findings highlight the critical need for increased awareness among growers and the implementation of effective management strategies to curb the spread of this pathogen.

The implications of this research are far-reaching. The proliferation of *D. necatrix* could have detrimental effects on biodiversity and the ecological balance within the affected regions. The comprehensive approach adopted by the study in detecting and isolating the pathogen paves the way for future research and management practices aimed at combating WRR.

As the South African avocado industry struggles with the threat of *D. necatrix*, the importance of ongoing research and collaboration becomes evident. There is hope for developing sustainable solutions to protect the nation's avocado orchards from this persistent threat.

THE GLOBAL CONTEXT AND HISTORICAL PRECEDENCE

WRR is not a new adversary in the world of agriculture. It has been a persistent problem in countries like Spain, Israel, and Japan, where severe infestations of *D. necatrix* have negatively impacted avocado, grapevine, pear, and apple orchards [3-6]. The pathogen's first identification in South Africa dates back to 1974, initially affecting apple and pear trees, as well as grapevines, in the Western Cape [7]. De-

spite efforts, the pathogen was not eradicated, leading to its detection in avocado orchards in 2016 [2].

The symptoms of WRR are often subtle and easily confused with other diseases, such as Phytophthora root rot. Infected trees may exhibit a decline in vigour, retarded growth, and sparse foliage. More advanced symptoms include wilting leaves, chlorosis, leaf drop, and the death of branches. In some cases, the disease progresses so rapidly that trees die with fruit and leaves still attached. A telltale sign of WRR is the presence of white mycelial growth on the root surface, tree trunk and in the soil.

THE WAY FORWARD FOR SOUTH AFRICAN AVOCADO ORCHARDS

For South African avocado growers, the battle against white root rot is just beginning. The study conducted by Hartley, Engelbrecht, and Van den Berg serves as a crucial step in understanding and managing this pathogen. It is imperative that growers remain vigilant, monitoring their orchards for signs of WRR and implementing the recommended control measures.

The fight against *D. necatrix* is a collective effort that requires the cooperation of researchers, growers, and policymakers. By fostering awareness and adopting a proactive stance, the South African avocado industry can rise to the challenge and protect its orchards from the threat of WRR.

For those interested in a more comprehensive understanding of the pathogen and its impact, the original study provides an in-depth analysis and is an invaluable resource that has laid the foundation for future research and development of management strategies.

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