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Assessing awareness, willingness, and barriers to adoption of DNA foil (rapid testing Toolkit) for cocoa swollen shoot virus disease among cocoa farmers in Ghana

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Abstract

Cocoa Swollen Shoot Virus disease (CSSVD), caused by the badnavirus and spread by mealybugs is one of the most economically significant cocoa virus diseases that poses the greatest threat to the cocoa production in West African countries, particularly in Ghana. It reduces cocoa yield by 70 % to 80 % and causes the death of cocoa trees within 2 to 3 years of infection at all stages of cocoa growth. Early detection in still asymptomatic trees is critical to minimising the spread and economic impact of the disease by implementing an integrated pest management protocol.

DNAfoil-Rapid Testing Toolkit (RTT) capable of detecting the viral infection in both symptomatic and asymptomatic trees from leaf extracts, offers a promising alternative for timely and on-farm detection of the virus was developed by SwissDeCode, in partnership with Mars Inc. The adoption of the innovative technology depends on various factors.

This study aimed to identify and analyse the factors influencing the adoption of DNA foil-Rapid Testing Toolkit (RTT) technology among cocoa farmers in Ghana, focusing on their awareness, willingness, and potential barriers to adopting the innovative technology. Primary data were collected through a cross-sectional survey of cocoa farmers in the study area. Information on farmers' knowledge of CSSVD, awareness and perception of DNA foil technology, willingness and barriers to adopting the technology was captured with the aid of a structured questionnaire. The data collected was analysed using descriptive and inferential statistics to identify key adoption drivers and barriers of the technology.

The findings of this study are expected to provide valuable insights into cocoa farmers' awareness, perceptions, and willingness to adopt the DNA foil Rapid Testing Toolkit (RTT) for Cocoa Swollen Shoot Virus Disease (CSSVD), which will serve as the benchmark for the policymakers, agricultural stakeholders, and extension service providers on strategies to promote DNA foil technology for effective CSSVD management. Strengthening adoption can contribute to sustainable cocoa farming, improved disease control, and enhanced agricultural resilience in Ghana.

Keywords: Cocoa farmers, Cocoa Swollen Shoot Virus Disease, determinants, DNA foil technology, early disease detection, Ghana

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