



Workshop on “Boosting Agricultural Resilience: Advancing Knowledge Sharing in the IPPC Technical Panel on Diagnostic Protocols (TPDP) and New Plant Pest Diagnostic Techniques with MAFF Japan”

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## NOVEL DIAGNOSTIC TECHNIQUES FOR EARLY AND ACCURATE DETECTION OF PLANT PESTS AND GHANA’S EXPERIENCE WITH PLANT VIRUSES’ DIAGNOSTICS

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Plant pests cause enormous yield losses in several crops of economic importance resulting in major economic losses in the agricultural industry worldwide. The spread of these plant pests/pathogens and the emergence of new ones is facilitated by human practices such as global trade and monoculture farming. Thus, early detection and identification of plant pests/pathogens is of utmost importance in reducing disease spread and the associated agricultural losses. Current techniques for plant pest detection include culture based, PCR-based, sequencing-based, and immunology-based techniques. Although these methods have revolutionized plant pest detection, they are not very reliable at asymptomatic stage, especially in case of pathogen with systemic diffusion, and are laboratory-based. The potential use of point-of-care devices, including biosensors, lateral flow devices and loop-mediated isothermal amplification (LAMP) are gaining popularity. Other methods such as metagenomics, high-throughput sequencing (HTS), remote sensing, artificial intelligence and machine learning, volatile organic compound (VOC) analysis and genome editing (CRISPR/Cas9) present opportunities for enhanced plant pest detection and identification. These novel techniques will complement the traditional methods of detection for a more precise, rapid, and comprehensive pest diagnosis, thus enhancing our ability to manage and control plant pests effectively.

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