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Molecular Detection of Fungal Pathogens, Activation of Defense Responses and Management Approaches for Crop Diseases

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Abstract

Disease diagnosis is an art as well as a science. Early disease detection and prevention are imperative to minimize the disease induced damage in crops. Recent trends in detection of plant pathogens include the development of more rapid diagnostics techniques which combine the ability of high specificity for the target organism with detection in very low amounts and at very early stages of infection. The initial infection process involving cell surface recognition events between plants and pathogens is essential for successful establishment of pathogens. In order to colonize host tissue and reproduce, a successful parasite must have accumulated the genetic information to eliminate, overcome, avoid or escape all of the host defences encountered. On the other hand, defense gene expression is to be a great extent regulated through the production of metabolites which act as signals. Activation of inducible defense responses is likely to be based upon recognition of pathogen associated molecular patterns, which bind to plant receptors. Recent progress in our understanding of beneficial microorganisms and their role on improvement of plant health status and disease management has developed formulations of biocontrol microorganisms. However, in order to improve their commercial use, it is extremely important to emphasize and concentrate on quality control, delivery system and studying the role of environmental factors for providing real benefit to the farmers.

Key words: Biocontrol, biopesticides, defense enzymes, immunotechniques, molecular markers

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