

Detection and Management of Tomato Leaf Curl Virus Disease and Its Whitefly Vector through Cultural Practices, Plant Promoting and Plant Extract for Inducing Disease Severity

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Abstract

In the Cambodia, pesticide usage in vegetable such as cucumber, cauliflower, brassica, tomato, and eggplant, among others, is quit high due to intense insect pest and disease pressure. Disease management options in solanum are extremely narrow especially when it comes to the insect-transmitted viral disease, leaf curl while the crop losses can be extensive. Tomato leaf curl caused by whitefly-transmitted disease caused by Tomato leaf curl virus (ToLCV) and Tomato yellow leaf curl virus (TYLCV) causing similar leaf curl diseases of tomato in other countries. The preponderance of evidence indicated that with climate change there will be an overall increase in the number of outbreaks of a wider variety of insect and pathogens. The possible increased use of fungicides and insecticides resulting from an increase in pest outbreaks will likely have negative environment and economic impacts for agriculture. Currently utilized as management strategies are: use of resistance cultivars if available, fungicide usage, cultural practices such clean surroundings, crop rotation. As a component of IPM, other management strategies need to be developed to effectively manage these diseases. There has been no study conducted to explore potential of chemicals to induce systemic resistance to plant pathogens in crops like tomato in the country. Hence, this research gives hope that induced plant resistance may have a positive outcome that can be a very important tool in combination with other management strategies to minimize or effectively manage viral plant diseases as well as insect pests. The general objective of the project is to investigate the potential of management tomato leaf curl to the economically important viral diseases and against insect pests, thereby integrating the foreseen technology for its use as part of disease and insect pest management for increased tomato production. This research seeks to conduct laboratory, screen house and field trials on the utilization of insect pest and disease management of tomato following three components as: component 1: Field survey, detection and training on leaf curl virus disease from Solanaceae; component 2: Cultural, Plant promoting and Plant extracts approaches for leaf curl management and component 3: Evaluation and integration of potentially effective technologies for leaf curl management under field conditions. The project is expected to determine the effects of mulching, use of yellow sticky trap, use of chemical inducers and plant extracts and plant growth promoting microorganisms and their best combination which can reduce population of insect vector, leaf curl disease severity and yield loss due to leaf curl under two different season. Also include a part of capacity building of Royal University of Agriculture, host the master students conduct their research on plant disease, researchers and extension staff in plant pathology and develop IPM technologies., as a whole.