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Early Blight of Tomato

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Abstract: Tomato is very important vegetable crop, grown all over the world. It is nutritionally rich, contains antioxidants and vitamins. Tomato production is affected by various nematodes, bacterial and fungal diseases. Among the fungal diseases, early blight of *Alternaria solani* is one of the most damaging disease. This disease cause premature defoliation result in heavy losses in quality and quantity of fruits. There are different means to control this disease viz. use of resistant varieties, application of protective fungicides, crops rotation and use of biocontrol agents. Still there are no economic measures to control this disease. For short term disease management program we have to follow single practice but for long term effective management we have to integrate various disease control measures. Most of the frequently used fungicides are highly specific and show single site mode of action. Continuous use of specific fungicides results in development of resistant in pathogens. Therefore routinely used fungicides are becoming less effective in disease control. Thus there is need of continuous evaluation of fungicide resistance in new and old fungicides against *Alternaria solani* to improve crop productivity.

Keywords: Tomato (*Lycopersicon Esculentum* Mill); Blight, *Alternaria Solani*, Productivity, Control Measures.

I. INTRODUCTION

The tomato is very important vegetable crop from Solanaceae family and grown worldwide (Tolentino et al 2011). Tomato (*Lycopersicon esculentum* Mill.) is the second most important vegetable after potato (Gondal et al. 2012). Tomato is used for local consumption due to its high nutritive values, antioxidant and curative properties (Sahu. et al 2013). It is also good source of vitamin A, C and E (Gondal et al 2012). It is native to South America (Sahu et al 2013). Tomato contains 95.3% of water, 0.07% calcium and niacin, and other compounds which have great importance in metabolic activities of humans (Gondal et al 2012). Tomato production is more important in recent years due to varied climatic adaptability and high nutritional value (Gondal et al 2012). Tomato plant is susceptible to various diseases caused by different agents such as bacteria, viruses, nematode, fungi and abiotic factors (Sahu et al 2013). Microbes interact with plant for hundreds of years by different ways such as commensalism, endophytism, symbiosis and parasitism

(Takken. et al 2010). The yield of tomato is specifically affected by wilt and blight diseases caused by *Fusarium* and *Alternaria* respectively. The genus *Alternaria* is soil born pathogen and many species of this genus including *Alternaria solani* is known to be plant pathogen (Alhussien. 2012). The *Alternaria solani* (Ellis and Martin) was first reported on potato plant by Jones and Grout in 1882 (Alhussien 2012).

The *Alternaria solani* is from phylum Ascomycota, class Othideomycetes, order Pleosporales and family Pleosporaceae (Alhussien 2012). *Alternaria solani* contains enzymes such as cellulases which degrade the host cell wall and also contain pectin methyl galacturonase which facilitate host colonization (Shahbazi et al 2011). *Alternaria solani* usually infect solanaceous crops including potato, tomato, eggplant and pepper (Carneiro, et al 2010). *Alternaria solani* (Ellis and Martin) is a casual agent of early blight on tomato (Madden et al 1978). Tomato plants are highly susceptible to early blight infection (Chaerani et al 2007). Among the fungal diseases, early blight is most dominant, serious and damaging disease (Gondal et al 2012). This disease affect crop production as they cause premature defoliation and result in heavy losses in production by reducing quality and quantity of fruit (Holm et al 2003). It is an important disease of tropical and subtropical areas of warm and wet weather (Madden et al. 1978). Crowded plantation, high rainfall and extended period of leaf wetness are responsible factors to induce disease development (Gondal. et al. 2012). *Alternaria* blight affect plant by reducing photosynthetic area which is very difficult to control (Pasche . et al 2004).

Failure to control this disease can cause reduction in yield (Malik et al 2014). There are various methods to control early blight such as rotation of crops on a 3 to 5 years schedule, cultivation of disease free transplant (resistant varieties), use of protective fungicides, and application of biological control agents and prevention of long periods of wetness. Use of chemical, biological methods and resistant varieties are the direct method (Biswas et al 2012). Cultivation of resistant varieties is ultimate control of this disease but currently highly resistant varieties against early blight are not known for

commercial cultivars (Chaerani et al 2007). However, farmers willing to get high yield, usually use varieties that are high yielding but less resistant to diseases (Gondal et al 2012). Combination of cultural and chemical measure is usually recommended to prevent disease development and to avoid heavy yield losses due to disease (Holm et al 2003). Till today, there is no economic way to manage and control crop diseases (Mougy et al., 2012). A short term disease management strategy involves just a single practice but the long term effective management usually uses integration of two or more disease control measures (Fazli and Ishtiaq 2010). Most of the recent fungicides are highly specific and single site in mode of action (Sahu et al 2013). Thus, there is need to screen new effective fungicides with novel mode of action which will be helpful to improve productivity and quality of tomato (Sahu et al 2013).

II. CONCLUSION

Tomato is locally consumed and used by people in daily food. It is very important fruit due to its high nutritive value and good source of vitamins and antioxidants. But production of tomato is getting affected by various diseases. *Alternaria solani* is major damaging among all the fungal diseases. Hence there is need to control this disease with evaluation of newer fungicide for effective management.

III. REFERENCES

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