

## CLIMATE CHANGE AND PLANT DISEASES

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ARTICLE ID: 053

### Introduction

Climate change is defined as a long term change in weather patterns at a particular place. The 21<sup>st</sup> century has faced the major changes in the climatic conditions of the earth due to rising temperature and other factors. The anthropogenic activities are the basic cause of this change. Development of plant diseases depend directly on the climatic factors like temperature, moisture in the air, etc. Climate change is affecting the plants and can lead to induction of plant disease epidemics in near future. This can threaten food security; if the major crops are infested with disease causing agents under favorable conditions for their growth resulted from climate change.

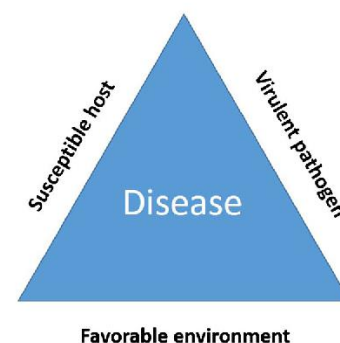
### Impact of climate change on plant diseases

Basically, the two factors have an adverse impact on plants:

1. Rising temperature
2. Rising carbon dioxide levels

- **Effect of Rising temperature**

A change in temperature activates dormant pathogens and adversely affects their pathogenicity for causing infections. Temperature plays a significant role in development of bacterial and fungal diseases. As it also, influence development and distribution of vectors, the incidence of vector borne diseases also increases. Research shows that rust diseases in wheat and oats are more prominent with increase in temperature. According to evidence, sunlight affects pathogens due to protective pigments in host tissue called phytoalexins.



Thus due to changes in temperature and precipitation the disease development is affected and may lead to epidemics.

- **Effect of Rising carbon dioxide levels**

Increased CO<sub>2</sub> levels can affect both the host and the pathogen in myriad of ways. Evolution of new races of pathogen may be the result of elevated temperature and carbon dioxide level. Plants decompose at a slow rate with increase in carbon dioxide, the pathogen overwinters in the debris and as serve as inoculums for infection in the next season. Such climatic conditions may even develop resistance in host against various chemicals used to treat the plant diseases. Infact; it is not always true that high concentrations of carbon dioxide provide favorable conditions for pathogen. For instance, the germination of conidia of *C. gloeosporioides* fungi is slower at high concentrations of CO<sub>2</sub> (700 ppm) than at lower concentrations of 350ppm.

### **Impact on plant disease management practices**

Plant disease management has been challenging due to changes in the climate. The efficacy of various chemicals like Fungicide and bactericide used in disease management, may change with increased CO<sub>2</sub>, moisture, and temperature. Exclusion of pathogens and quarantines through regulatory measures may become more difficult as unexpected pathogens might appear frequently on imported crops. Therefore, proper sanitation near the fields and alternative ways of managing the diseases is required.

### **Conclusion:**



Understanding the probable effects of climate change on agricultural crops, their severity on disease development is an important issue. Lack of knowledge of climate change, disease management can play havoc in the field of agriculture. Therefore, Proper information of plant diseases in field, data of probable effects of climate change and measures to curb disease epidemics is essential.