

CHAPTER- 8

Mildew, alternaria blight, and Tundu diseases

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Understanding Mildew, Alternaria Blight, and Tundu Diseases in Agriculture

Introduction

In the realm of agriculture, the battle against diseases is constant and multifaceted. Among the plethora of agricultural diseases, mildew, alternaria blight, and tundu diseases stand out for their detrimental effects on crop yield and quality. This chapter delves into the intricacies of these three diseases, exploring their causes, symptoms, management strategies, and the implications they hold for agricultural practices

Mildew: The Silent Menace

Mildew, caused by various species of fungi belonging to the order Erysiphales, poses a significant threat to a wide range of crops including cucumbers, grapes, melons, and pumpkins. Its characteristic powdery white patches on leaves, stems, and fruits are a telltale sign of infection. Mildew thrives in humid conditions with moderate temperatures, making it a recurring problem in many agricultural regions.

The lifecycle of mildew begins with the release of airborne spores from infected plant tissues. These spores settle on susceptible plants and germinate under favorable environmental conditions, leading to the establishment of new infections. As the disease progresses, the affected plant's photosynthetic capacity is compromised, resulting in stunted growth and diminished yield.

Management of mildew typically involves a combination of cultural, chemical, and biological strategies. Cultural practices such as crop rotation and maintaining proper spacing between plants can help reduce the spread of the disease. Additionally, fungicides containing active ingredients like sulfur or potassium bicarbonate can be applied to control mildew outbreaks. Biological control agents, such as certain strains of *Bacillus subtilis*, have also shown promise in mitigating mildew infections through competitive exclusion.

Alternaria Blight: A Threat to Crop Health

Alternaria blight, caused by fungi of the genus *Alternaria*, is a common foliar disease affecting a wide array of crops including tomatoes, potatoes, and brassicas. Characterized by dark, necrotic lesions on leaves, stems, and fruits, alternaria blight can lead to significant yield losses if left unchecked.

The fungi responsible for alternaria blight produce large quantities of airborne spores, which serve as the primary mode of disease transmission. Once deposited on susceptible plant tissues, these spores germinate and penetrate the host's epidermal cells, initiating infection. As the disease progresses, the affected tissues undergo necrosis, resulting in the formation of sunken lesions with concentric rings.

Effective management of alternaria blight requires a holistic approach encompassing cultural, chemical, and genetic strategies. Crop rotation, sanitation, and the removal of infected plant debris can help minimize the buildup of inoculum in the field. Fungicides containing active ingredients such as azoxystrobin or chlorothalonil can be applied preventively to protect susceptible crops from alternaria blight. Furthermore, the development of resistant crop varieties through traditional breeding or genetic engineering holds promise for long-term disease control.

Tundu Disease: A Persistent Challenge

Tundu disease, caused by the wheat streak mosaic virus (WSMV), is a major constraint to wheat production in many parts of the world. Characterized by yellow streaks and mosaics on leaves, tundu disease can cause significant yield losses if left unmanaged. The virus is primarily transmitted by the wheat curl mite (*Aceria tosichella*), which feeds on infected plant tissues and vectors the virus to healthy plants during feeding.

Control of tundu disease relies heavily on integrated pest management (IPM) strategies aimed at reducing the population of the wheat curl mite and minimizing virus transmission. Cultural practices such as the use of certified virus-free seed and the destruction of volunteer wheat plants can help prevent the introduction and spread of WSMV in wheat fields. Additionally, insecticides targeting the wheat curl mite can be applied at the appropriate times to suppress mite populations and reduce virus transmission.

Conclusion

In conclusion, mildew, alternaria blight, and tundu disease represent formidable challenges to agricultural productivity and food security worldwide. By understanding the underlying causes and dynamics of these diseases, farmers and agricultural practitioners can implement effective management strategies to mitigate their impact. Through continued research and innovation, the development of sustainable and integrated approaches to disease control holds the key to safeguarding global food production against these insidious threats.