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Popular Article

Late blight of potato and its management through the application of different fungicides and organic amendments

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Abstract

Late blight of potato is a highly destructive and economically significant disease that affects potato and other Solanaceae family plants. Late blight, a disease that causes head and blind tubers, is one of the most destructive potato diseases. It not only affects the yield but also lead to huge monitoring expenses for disease control. The disease was first reported during the Irish potato Famine in the mid-19th century, which had devastating impact on Ireland and other parts of Europe. *Phytophthora infestans*, the causal agent of late blight, can have a devastating impact on potato crops, infecting the impact on potato crops, infecting the foliar portion in the field and the tubers in storage, resulting in complete crop failure. The spores of this pathogen are introduced to healthy plants through wind and rain, making it essential to implement effective prevention methods. An integrated disease management, and advanced disease management techniques, has been developed and worldwide to control late blight. This approach has been particularly successful in tropical regions where the fungal innocuous present for most of the year, making

it a highly effective choice for disease management. By integrating these methods, farmers can reduce the risk of late blight and protect their potato crops from this devastating disease.

Keywords: potato, late blight, yield loss, affects, management,

Introduction

Late blight of potato is a devastating disease caused by *phytophthora infestans*, leading to significant yield losses and economic damage. It is characterized by water-soaked lesions on leaves, stem, rapid spread, and reduced tuber quality. Favored by cool, moist weather, late blight is a major threat to global potato production, with significant economic and food security implications. Late blight was responsible for the Irish potato Famine in the 1840s, which led to widespread poverty, starvation, and emigration. The disease has continued to be a major threat to potato globally.



Pathogen of late blight

The late blight pathogen, *Phytophthora infestans*, originated from Central Mexico and belongs to the genus *Phytophthora* sp, which comprises Oomycetes that are distinct from true fungi. This disease is notorious for causing the Irish famine in the mid-19th century and continues to pose a significant threat to potato production worldwide. Late blight thrives in cool and gloomy conditions, particularly during rainy periods, and can result in 100% yield loss in severe attacks on susceptible species. The symptoms of late blight typically appear as green-brown or yellow spots on foliage and stems, which eventually become necrotic as the pathogen grows. These symptoms can manifest within hours of infection, depending on environmental conditions and host susceptibility.

Chemical control by applying fungicide

Controlling late blight of potato without the use of fungicides seems unlikely. Effective control of the disease can be achieved by applying chemical fungicides at the right rates and intervals, taking into account climatic conditions and disease severity. The success of fungicides in managing late blight depends on their proper use and timing of application. Historically, the first effective fungicide used to combat late blight was the Bordeaux mixture, a copper sulfate chemical, which was used after the Irish potato famine caused by *P. infestans*. However, this chemical has several environmental implications. In recent decades,

advances in synthetic chemistry have led to the development of more advanced and relatively less hazardous chemicals, but their excessive use can still pose ecological, environmental, and financial problems. Commonly used fungicides for controlling late blight include cymoxanil manpower, cymoxanil amoxapine, and flurazepam, which are available under different trade names.

Animal manure

Animal manure is a natural fertilizer made from waste of animals, such as cow, pig, and chickens. It is rich in nutrients like nitrogen, phosphorus, and potassium and can improve soil fertility and structure. Animal manure can be used as a fertilizer, soil conditioner or compost ingredients and is a sustainable alternative to synthetic fertilizer. It is often collected, processed, and applied to crops or soil to promote healthy plant growth and reduce waste.

Compost

Compost is a natural, organic material created by decomposing food waste, leaves, and other organic materials. It improves soil structure, fertility and overall health, supporting healthy microbes and reducing waste. Compost is made by collecting organic materials, creating a compost pile, monitoring temperature, and harvesting the compost after several months. It can be used as a soil amendment, mulch or potting mixture in gardening, landscaping and agriculture, promoting sustainable practices and reducing the need for chemical fertilizer.



Conclusion

Late blight is a highly destructive disease that can cause significant losses in potato crops, with yields declining by up to 90%. To combat this, it is essential to identify potato varieties that are tolerant or vulnerable to late blight and distribute them to suitable areas. A combined approach of using fungicides with moderately tolerant potato varieties is an effective way to manage late blight infection. The application of fungicides at the prescribed rate and timing can reduce the development of late blight disease, resulting in a decrease in disease index and an increase in tuber yield. This approach can also reduce contamination from potato-late blight and increase potato tuber yield. In tropical regions, where fungal inoculate are present for most of the year, late blight prevention is a critical strategy for disease management. The selection and implementation of a successful management strategy require a thorough understanding of the disease's growth, epidemiology, and life cycle. The integrated disease management (IDM) approach is the most effective way to manage late blight, as it is environmentally friendly, cost-effective, and can help mitigate the impact of the disease.

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