



Anthracnose of Banana: A Major Catastrophic Post Harvest Disease in India

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Abstract

Anthracnose of banana is a plant disease caused by various fungal species, primarily *Colletotrichum musae*. This disease affects banana plants and can lead to significant economic losses in banana-producing regions. The key characteristics of anthracnose in bananas include the development of dark, sunken lesions on the fruit, leaves, and stems. These lesions are often surrounded by orange to pinkish spore masses.

The disease can spread rapidly, particularly in warm and humid conditions, leading to the decay of banana fruit and reduction in market quality. Control measures typically involve the use of fungicides, cultural practices such as pruning and removing infected plant parts, and maintaining good sanitation in plantations. Additionally, breeding for disease-resistant banana varieties is an on-going research focus to mitigate the impact of anthracnose. Understanding the biology and management of anthracnose is essential for sustaining banana production and safeguarding this important global crop.

Introduction

Anthracnose of banana, caused by various species of the fungal genus *Colletotrichum*, is a widespread and economically significant disease that affects banana plants, including both dessert and cooking banana varieties. This disease is a major concern for banana growers and producers around the world. Anthracnose can lead to substantial crop losses, decreased market value, and challenges in maintaining a healthy and productive banana plantation.

The characteristic symptoms of anthracnose in banana plants include the development of dark, sunken lesions on various plant parts such as fruit, leaves, and stems. These lesions are often surrounded by pinkish to orange spore masses, making them visually distinctive. In addition to causing aesthetic damage to banana fruit, anthracnose lesions can lead to fruit rot and the formation of unattractive blemishes, rendering the fruit unsuitable for sale in fresh markets.

Anthracnose is particularly problematic in regions with warm and humid climates, as these conditions favour the growth and spread of the pathogenic fungi. Rainfall, high humidity, and the presence of free moisture on plant surfaces are conducive to the development of this disease. The spores of *Colletotrichum* spp. can be spread by wind, rain, or contaminated farm equipment, further contributing to its rapid dissemination.

Fruit Symptoms

Dark Lesions: Anthracnose often starts as small, water-soaked lesions on the banana fruit.

Lesion Enlargement: Over time, these lesions enlarge and become sunken and dark in colour, typically brown to black.

Spore Masses: Infected areas may be covered with pinkish to orange spore masses or slimy masses, which are visible in the sunken lesions.

Fruit Rot: As the disease progresses, it can lead to fruit rot, making the affected bananas unsuitable for consumption or sale in fresh markets.



Figures: Symptoms of Anthracnose of Banana

Postharvest management of anthracnose in bananas is crucial to prevent the disease from spreading and causing spoilage during storage and transportation.

Here are some key practices and strategies for managing anthracnose after harvesting bananas:

(i) Proper Harvesting: Ensure that bananas are harvested at the right stage of ripeness, as overripe or damaged fruit is more susceptible to anthracnose infection. Handle the fruit gently to avoid physical damage.

(ii) Sanitization of Harvesting Tools and Containers: Clean and disinfect harvesting tools, such as knives and clippers, as well as containers, to minimize the risk of introducing the pathogen to the harvested fruit.

(iii) Temperature Management: Maintain appropriate storage temperatures to slow down the development of anthracnose. The ideal temperature for banana storage depends on the variety but is typically between 13°C to 15°C (55°F to 59°F). Avoid storing bananas at temperatures below 12°C (54°F) to prevent chilling injury.

(iv) Relative Humidity Control: Maintain the relative humidity in the storage area at around 85-90%. This helps to prevent moisture loss from the fruit, which can make them more susceptible to infection.

(v) Ventilation: Ensure proper ventilation to reduce the build up of humidity in the storage area, as excessive moisture can promote fungal growth.

(vi) Packaging: Use clean and dry packaging materials to prevent fruit-to-fruit contact and reduce the risk of pathogen spread. Properly ventilated packaging can also help maintain the right humidity level.

(vii) Sorting and Grading: Sort and grade bananas before packing to identify and remove fruit with anthracnose symptoms. Affected fruit should not be included in shipments.

(viii) Fungicide Treatment: If deemed necessary, you can apply postharvest fungicides according to recommended guidelines and regulations. Consult with local agricultural authorities for approved fungicides and application methods. It's essential to follow appropriate safety measures when handling and applying chemicals.

(ix) Storage Period: Minimize the duration of storage to reduce the risk of anthracnose development. Plan your harvest and distribution schedules accordingly.

(x) Regular Monitoring: Monitor stored bananas regularly for any signs of anthracnose development. Isolate and remove any infected fruit to prevent the spread of the disease.

(xi) Ethylene Gas Treatment (for Ripening): If bananas need to be ripened for market, you can use ethylene gas treatment in a controlled environment to ensure uniform ripening while minimizing the risk of disease spread.

(xii) Education and Training: Educate workers and staff involved in postharvest handling on the recognition of anthracnose symptoms and safe handling practices.

(xiii) Record-Keeping: Maintain records of postharvest practices, including fungicide applications, storage conditions, and monitoring results, to help improve future management strategies.

Effective postharvest management of anthracnose in bananas involves a combination of good agricultural practices, proper storage conditions, and preventive measures to minimize the risk of infection and spoilage during transportation and marketing.

Conclusion

In conclusion, anthracnose of banana is a significant and economically important disease that affects banana plants, impacting fruit quality and marketability. This fungal disease, caused by various *Colletotrichum* spp. is widespread in regions with warm and humid climates, which are ideal conditions for its development.

Effective postharvest management of anthracnose is also essential to prevent the spread of the disease during storage and transportation. This includes proper harvesting, temperature and humidity control, packaging, and regular monitoring.

Ongoing research and collaboration with agricultural experts and extension services are vital to improving anthracnose management strategies and minimizing its impact on banana production. By implementing these measures, banana growers can work toward maintaining healthy and high-quality banana crops, ensuring their availability in global markets, and reducing economic losses associated with anthracnose.

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