



## SEASONAL INCIDENCE OF PHYTOPHTHORA BLIGHT ON SESAME AND ITS CORRELATION WITH WEATHER PARAMETERS

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### ABSTRACT:

Sesame (*Sesamum indicum*) is an important oilseed crop grown widely in tropical and subtropical regions. Among the various diseases affecting sesame, Phytophthora blight caused by *Phytophthora* spp. is one of the most destructive diseases responsible for severe yield losses. The occurrence and severity of this disease are strongly influenced by environmental factors such as temperature, relative humidity and rainfall. The present study assesses the seasonal incidence of Phytophthora blight in sesame and its relationship with different weather parameters. The results revealed that the highest disease incidence occurred during September when high relative humidity, moderate temperature and continuous rainfall provided favorable conditions for pathogen development. Understanding the relationship between weather parameters and disease incidence can help in developing forecasting systems and adopting timely disease management practices.

**KEYWORDS:** Sesame, Phytophthora blight, Weather parameters, Relative humidity, Rainfall, Disease incidence

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### INTRODUCTION:

Sesame (*Sesamum indicum*) is one of the oldest cultivated oilseed crops and is widely grown in tropical and subtropical climates. The crop is highly valued for its high-quality edible oil, rich



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nutritional composition and medicinal importance. According to **Edwin John Butler (1918)**,  
sesame cultivation has long been affected by several fungal diseases which significantly reduce

crop productivity in humid regions. Sesame seed contains about **45–55% oil and 20–25% protein**, making it an important source of edible oil and nutrients in many developing countries. However, the productivity of sesame is often limited by several biotic stresses, particularly fungal diseases. Among the major diseases, **Phytophthora blight** is considered one of the most destructive diseases of sesame. The disease is caused by soil-borne pathogens belonging to the genus *Phytophthora*, which can infect the crop at different growth stages ranging from seedling stage to pod formation stage. Severe infection often leads to plant wilting, stem rot, leaf blight and eventually plant death. Environmental factors play a crucial role in the development and spread of this disease. **Verma et al. (2005)** reported that warm temperature combined with high humidity and heavy rainfall significantly increases the incidence of *Phytophthora* blight in sesame fields. Similarly **Kalita et al. (2002)** observed that waterlogged soil conditions and prolonged rainy periods create ideal conditions for the survival and multiplication of *Phytophthora* species.

Therefore, studying the seasonal incidence of *Phytophthora* blight in relation to weather parameters is essential for developing disease forecasting models and effective management strategies.

### WEATHER PARAMETERS AND DISEASE INCIDENCE:

Weather parameters during the crop growth period play a significant role in the occurrence and severity of *Phytophthora* blight disease in sesame. Temperature, relative humidity and rainfall influence pathogen growth, infection and disease spread.

Month	Max T (°C)	Min T (°C)	RH1 (%)	RH2 (%)	Rainfall (mm)	Rainy Days	Plants affected/10
July	34.4	24.8	85	68	239.8	15	0
August	31.2	22.4	88	76	298.5	14	4
September	27.1	19.3	94	90	267	9	8
October	30.2	16.6	83	67	78.9	5	0

The data indicate that disease incidence increased with increasing humidity and rainfall during the monsoon season.

Month	Plants affected/10
July	0
August	4



September	Volume - 3, Issue - 2, December 2025, ISSN: 2583-9004
October	0

**Fig. 1 Seasonal incidence of Phytophthora blight in sesame during kharif season showing maximum disease incidence in September.**

Month	Rainfall
July	239.8mm
August	298.5 mm
September	267 mm
October	78.9 mm

**Fig. 2 Monthly rainfall pattern during sesame crop season indicating favorable conditions for disease development during August–September.**

Month	RH I	RH II
July	85	68
August	88	76
September	94	90
October	83	67

**Fig. 3 Effect of relative humidity on the development of Phytophthora blight in sesame.**

### SEASONAL DISEASE INCIDENCE:

Phytophthora blight is an important soil-borne disease that may occur at any stage of the sesame crop. The study showed that disease incidence started during August and reached its peak during September.

During September, morning relative humidity reached about **94%** while evening relative humidity was around **90%**. At the same time, temperature remained below **30°C**, which created highly favorable conditions for disease development.

Continuous rainfall of about 202 mm during 13–18 September 2022 also increased soil moisture and environmental humidity, resulting in severe disease incidence.

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Similar observations were reported by ~~Vernia et al. (2005)~~ who reported that temperature between ~~25–35°C~~ combined with high humidity favors the development of Phytophthora diseases, whereas the pathogen growth declines when temperature exceeds 35°C.

## DISEASE DISTRIBUTION AND YIELD LOSS:

Phytophthora blight was first reported in India by **Butler (1918)**. The disease is widely distributed in major sesame-growing regions of India including Madhya Pradesh, Rajasthan, Uttar Pradesh and Gujarat.

Studies conducted by **Singh et al. (2005)** reported that yield losses due to Phytophthora blight may range from **66% to 79.8%** under severe infection.

Under favorable environmental conditions, plant mortality may reach **72–80%**, and in extreme cases the disease may cause complete crop failure.

Severe infection results in leaf blighting, stem rot and premature drying of plants, ultimately reducing capsule formation and seed yield.



*Figure: Field symptoms of Phytophthora blight on Sesamum indicum at pod formation stage.*

## DISEASE MANAGEMENT:



## Chemical Control:

For the management of **Phytophthora blight** in **Sesamum indicum**, fungicidal sprays are effective under field conditions. Spraying **0.3% copper oxychloride (Fytolan)** at **20, 40 and 60 days after sowing** helps reduce disease severity significantly. Copper-based fungicides act as protectants by inhibiting spore germination and preventing the spread of the pathogen. Studies reported by **Kalita et al. (2002)** indicated that copper fungicides effectively suppress the growth and spread of *Phytophthora* pathogens in the field.

## Biological Control:

Biological management involves the use of beneficial microorganisms to suppress the pathogen in soil. Seed treatment with bio-agents such as *Trichoderma viride*, *Trichoderma harzianum*, and *Pseudomonas fluorescens* helps reduce pathogen population and protect plants during early growth stages. These organisms inhibit the pathogen through competition, antibiosis, and by enhancing plant resistance, thereby reducing disease incidence and improving crop health and yield.

## CONCLUSION:

The incidence of *Phytophthora* blight in sesame is strongly influenced by weather parameters. High rainfall, high relative humidity and moderate temperature during September provide favorable conditions for disease development. Therefore, monitoring weather parameters and adopting appropriate management practices can help in predicting disease outbreaks and reducing crop losses. Understanding the relationship between environmental factors and disease incidence will also help in developing early warning systems and integrated disease management strategies for sesame cultivation.

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