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Diagnosis of Foliar Diseases in Cotton Growing Regions of Bharuch

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A B S T R A C T

In this experiment, different tehsils of Bharuch district were closely examined for various foliar diseases in different cultivars. A survey was conducted on cultivars' field during the crop season and a fix point survey on cotton was conducted periodically at RCRS farm (Year 2021-22 and 2022-23). The survey data included the per cent disease intensity which were found vary as region to region as well year to year. Survey conducted on foliar diseases in cotton cultivars across different tehsils of the Bharuch district is informative and highlights the importance of monitoring these diseases over multiple crop seasons. Certain regions demonstrated higher incidences of foliar diseases, which may be attributed to local climatic condition. The yearly variation indicates the need for ongoing monitoring to adapt management strategies effectively and respond to emerging threats.

Introduction

Cotton is one of the most important commercial crop and it is the back bone of national economy of our country. Cotton farming is an important sector of agriculture in India, with a long history dating back to ancient times with a diverse range of varieties grown across different regions of the country. Cotton is an important crop for many farmers in India, especially those in the central and southern parts of the country.

Cotton farming in India is characterized by a mix of large-scale commercial farms and small- holder farms. Over the years, Indian cotton farmers have faced a number of challenges, including pest and disease outbreaks, market fluctuations, and environmental degradation. However, through innovative farming practices, research and development and the government support, the sector has continued to thrive, contributing to the country's economic growth and development (Bhoomika *et al.,* 2023).

In India, thirty diseases have been reported for cotton crop. Cotton suffers from several diseases *viz*., soil-borne and foliar diseases.

Among them, grey mildew, Alternaria blight, bacterial blight, ascochyta blight, target spot, Cercospora leaf spot and stemphyllium leaf spot are foliar diseases.

Several researchers explore the foliar pathogens causing considerable losses in cotton across the country. But, still the systematic studies need to be carried out to know the perfect cause of the diseases.

Hence, the present study will be carried out to know the occurrence of foliar diseases in cotton growing regions of Bharuch jurisdiction.

Materials and Methods

Occurrence of the foliar diseases was noticed during both the year 2021-22 and 2022-23. The fields were selected on the basis of random survey and the plants were be chosen randomly. Infected samples were collected from eight tehsils of Bharuch district and from each tehsil five villages were surveyed and from each villages five fields were selected for the observations.

The five leaves from the middle and lower portion of the plants were subjected to standard scale (0-4) of particular diseases (Sandipan *et al.,* 2017) and then these grades were converted into per cent disease intensity (PDI) by using the formula given by Wheeler (1969).

$$\text{Disease intensity (\%)} = \frac{\text{No. of infected plants}}{\text{No. of leaves observed x Max. Grade}} \times 100$$

Results and Discussion

The experiment conducted across various tehsils of the Bharuch district provides valuable insights into the prevalence of foliar diseases in cotton cultivars during the crop seasons of 2021-22 and 2022-23.

A detailed survey was undertaken to assess the incidence of Alternaria Leaf Spot (ALS), Curvularia Leaf Spot (CLS), and Bacterial Leaf Blight (BLB), focusing on their average percent disease intensity (PDI) (Table-1).

Alternaria Leaf Spot (ALS)

The highest average PDI for ALS was recorded in Amod tehsil, with a significant value of 15.33%. This indicates a notable presence of this disease in that region, highlighting potential susceptibility of the cultivars being grown there.

Curvularia Leaf Spot (CLS)

Jambusar tehsil showed the highest average PDI for CLS, with a value of 9.08%. This lower intensity compared to ALS suggests that while CLS is present, it is not as severe in Jambusar.

Bacterial Leaf Blight (BLB)

Hansot tehsil had the highest average PDI for BLB, recorded at 15.60%. This elevated level points to significant concerns regarding this disease in that area, necessitating management strategies to control its spread.

An important observation during the subsequent crop year of 2022-23 was a marked decline in disease intensity across all tehsils. This reduction could be attributed to favorable environmental conditions that may have mitigated the spread of these foliar diseases.

Understanding the fluctuations in disease intensity over the two years is crucial for farmers, as it allows for better-informed decisions regarding disease management practices and crop selection in affected areas.

Table.1 Average Per cent Disease Intensity (PDI) of cotton foliar diseases

Sr.No.	Tehsils	2021-22			2022-23		
		ALS	CLS	BLB	ALS	CLS	BLB
1	Bharuch	13.81	6.17	13.63	7.90	4.38	9.51
2	Jagadiya	14.76	6.26	14.70	9.25	1.79	8.86
3	Valia	15.18	7.67	13.87	9.20	2.93	7.30
4	Vagra	13.39	0.00	12.20	8.97	2.80	8.99
5	Amod	15.33	4.32	14.09	9.13	1.99	8.10
6	Hansot	14.34	8.72	15.60	10.36	5.68	8.22
7	Jambusar	13.57	9.08	11.95	8.84	0.00	8.58
8	Ankleshwar	13.94	0.00	12.61	9.39	3.50	8.83

ALS: Alternaria Leaf Spot; CLS: Curvularia Leaf Spot; BLB: Bacterial Leaf Blight

Overall, the collected data serve as a critical tool for assessing and monitoring foliar disease dynamics in cotton, ultimately contributing to improved agricultural strategies and better yield outcomes in the Bharuch district.

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Author Contributions

J. R. Pandya: Investigation, formal analysis, writing—original draft. R. R. Waghunde: Validation, methodology, writing—reviewing. R. R. Patel:—Formal analysis, writing—review and editing. D. M. Pathak: Investigation, writing—reviewing.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent to Publish Not applicable.

Conflict of Interest The authors declare no competing interests.

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