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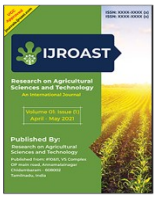

Survey of Alternaria leaf spot of brinjal in Navsari district of South Gujarat

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ABSTRACT

Brinjal (*Solanum melongena* L.) is an important commercial vegetable crop of South Gujarat. It was found to be attacked by Alternaria leaf spot in moderate to severe form and inflicting losses in brinjal yield. Due to the seriousness of the disease, research on survey of Alternaria leaf spot was carried out. The survey studies indicated that the Alternaria leaf spot (*Alternaria* sp.) was of common occurrence and distributed in all five taluks of Navsari district, during the *kharif* 2019-20. The results revealed that among five talukas, Navsari taluka (26.42% PDI) was recorded the highest disease intensity followed by Jalalpore (21.91% PDI), Chikhli (21.72% PDI), Vansda (19.81% PDI) and Gandevi (14.13% PDI) taluk of Navsari district. Maximum disease intensity of leaf spot was observed in Viraval (33.70% PDI) village of Navsari taluk. While least per cent disease intensity (PDI) was recorded in Vanarasi (9.62% PDI) village of Vansada taluk of Navsari district. During the survey, leaf spot intensity was observed in all the villages surveyed and both the local and hybrid varieties were found to be infected with the disease.

Introduction

Brinjal (*Solanum melongena* L.) belongs to night shade family solanaceae, grown in sub-tropical and tropical regions. The name brinjal is popular in Indian subcontinent and is derived from Arabic and Sanskrit language. The top five brinjal producing countries are China (28.40 million tons with 57 per cent share in world's total), India (13.40 million tons with 27 per cent share in world's total), Egypt (1.20 million tons), Turkey (0.82 million tons) and Iran 2 (0.75 million tons). In Asia and Mediterranean, brinjal ranks among the top five most important vegetable crops [1]. In India, brinjal is one of the most common and popular vegetable crop grown throughout the country except higher altitudes. It is cultivated in India about 7.36 lakh ha area with a contribution in productivity of 14.138 million tonnes to total vegetable production [2]. In Gujarat, it occupies 70880 hectare area with production of 14.23 lakh metric tonnes in the year 2017-18 [3]. It is a major vegetable of South Gujarat growing in districts namely Bharuch, Narmada, Dang, Surat, Tapi, Valsad and Navsari. Among these Surat, Tapi and Navsari have the highest area under brinjal crop [4]. In Navsari district, the crop is cultivated in 3067 hectares with production of 60236 metric tons and average yield of brinjal is 19.29 metric tons per hectare [5]. Many diseases are reported on brinjal, among them the important pathogenic fungi, *Alternaria* sp. causes leaf spot disease in the crop. Further, the pathogen infected seeds caused reduction in seed germination also. Brinjal as one of the most important vegetable cropin southern region of Gujarat, was found to be suffering from leaf spot disease in moderate to severe form. The crop was severely attacked by this disease in *kharif* season. Considering the seriousness of the problem, the present study on survey of Alternaria leaf spot was carried out in brinjal.

Materials and Methods

An intensive random rowing survey was carried out in five talukas *viz.,* Navsari, Jalalpure, Gandevi, Chikhli, Vansda of Navsari district to know the intensity of Alternaria leaf spot during *kharif* 2019-20. Multistage random sampling were followed in which from each taluka, three villages were selected and from each village, two farmers' field were selected for recording the observations. Disease intensity of Alternaria leaf spot was recorded in the brinjal field from September to November 2019. Five sites (1×1m) were marked in each of the field (four from each corner and one in the center) and ten plants, excluding those plants in the border lines were randomly selected from each site. Three leaves each from top, middle and bottom portion of a plant were observed critically for recording the per cent leaf spot intensity by using 0-9 grade and the disease rating was recorded by adopting the methodology suggested by Mayee and Datar (1986).

Description of disease rating scale (Mayee and Datar, 1986)

Score	Description
0	Free from disease symptoms
1	One or two necrotic spots on a few lower leaves of plants, covering less than 1 per cent of surface area of the leaf
3	A few isolated spots on leaves, covering at least 1 to 10 per cent of the plant leaf
5	Many spots coalesced on the leaves, covering nearly 11 to 25 per cent of the surface of the plant leaf
7	Irregular, blighted leaves and sunken lesion with prominent concentric rings on the leaves and on the stem petiole, covering 26 to 50 per cent leaf area of the plant
9	Whole plant blighted, leaves and fruits starting to fall down, covering more than 50 per cent leaf area of the plant

The Per cent Disease Intensity (PDI) was worked out by using following formula (Mayee and Datar, 1986).

$$\text{Per cent Disease Intensity (PDI)} = \frac{\text{Sum of all numerical ratings}}{\text{Number of leaves observed x maximum of grade scale}}$$

RESULTS AND DISCUSSION:

To find out the status of Alternaria leaf spot of brinjal caused by *Alternaria* sp., a multistage roving survey was carried out in five talukas of Navsari district viz., Navsari, Jalalpore, Gandevi, Chikhli and Vansda during the month of September - November 2019. Three villages from each taluka and two fields in each village were surveyed. The observations on per cent disease intensity was recorded and presented in Table-1 and Figure-1. During the survey leaf spot intensity was observed in all the villages surveyed and both in local and hybrid varieties. The leaf spot intensity in surveyed villages was ranging from 9.62 to 33.70 per cent with Average 20.80 per cent. The highest disease intensity (33.70%) was observed in Viraval village in local variety, while lowest intensity (9.62%) of leaf spot was observed in Vanarasi village of Vansda taluka in hybrid variety of brinjal. In Navsari Taluka, leaf spot intensity was ranging from 16.30 to 33.70 per cent (Av. 26.42%). The highest PDI was recorded in Viraval village (33.70%) in local variety, while lowest was observed in Dharagiri village (16.30%) in hybrid variety. In Jalalpore Taluka, per cent disease intensity was ranging from 13.52 to 29.07 per cent (Av. 21.91%). The highest PDI was recorded in Pethan village (29.07%) in local variety and lowest PDI was observed in Eroo village (13.52%) in hybrid variety.

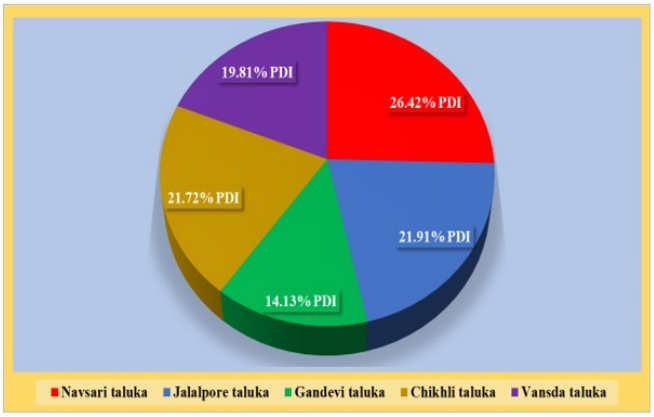
In Gandevi Taluka, per cent disease intensity was ranging from 10.37 to 19.81 per cent (Av. 14.13%). The highest PDI was recorded in Sonwadi village (19.81%) in local variety and lowest PDI was observed in Pathri village (10.37%) in hybrid variety. In Chikhli Taluka, per cent disease intensity was ranging from 18.52 to 24.63 per cent (Av. 21.72%). The highest PDI was recorded in Samroli village (24.63%) in local variety and lowest PDI was observed in Majigam village (18.52%) in hybrid variety. In Vansda Taluka, per cent disease intensity was ranging from 9.62 to 31.11 per cent (Av.19.81%). The highest PDI was recorded in Bhinar village (31.11%) in local variety and lowest PDI was observed in Vanarasi village (9.62%) in hybrid variety.

Minimum average disease intensity of Alternaria leaf was recorded in Gandevi taluka (14.13%) followed by Vansda taluka (19.81%), Chikhli taluka (21.72%) and Jalalpore taluka (21.9 1%), while maximum in Navsari taluka (26.42%). The survey results (Table 1 and Figure1) clearly showed that the disease was present in more or less severe form in almost all surveyed taluks of Navsari district. From these results, the disease is considered as important disease in both local as well as hybrid varieties of brinjal in the area. The result of present survey clearly indicated that Alternaria leaf spot could be a serious disease of brinjal in South Gujarat region because of susceptible local varieties and favorable weather conditions and non-availability of effective control measure. This addresses the need to formulate integrated and effective control measures. Singh and Shukla (1986) carried out a survey on *Altenaria alternata* appeared on eggplant in the first half of July and found that the infection increased until November after that there was a decline in severity with the lowering of temperature and relative humidity (RH) up to December and maximum disease occurred in mid -October to mid-November. [6] surveyed on leaf spot of brinjal (A. alternata) and found that leaf spot disease intensity was observed up to 25.32 per cent. Maximum disease intensity was observed in Bagru village (25.32%) while minimum in Phulera village (9.20%). [7] observed the leaf spot disease severity of eggplant at different regions of Basra P rovince and recorded that all the eggplant cultivated regions were infected with leaf spot disease, ranged from 20 to 50 per cent. The result of present investigation was similar to with above survey study results. The Alternaria leaf spot intensity in different location of Navsari district was ranging from 9.62 to 33.70 per cent. The difference may be due to difference in weather conditions, varieties, location and favourable microclimate of the field. Another reason for the severity of leaf spot disease in Navsari district could be due to mono-culturing and continuous off-season cultivation of brinjal crop and growing susceptible local varieties.

Table-1: Leaf spot intensity in brinjal at different farmer's field in Navsari District of South Gujarat

District	Taluk	Village	Variety	Average per cent disease intensity %)	Overall average PDI for taluk (%)
Navsari	Navsari	Adada	Local	29.26	26.42
		Dharagiri	Hybrid	16.30	
		Viraval	Local	33.70	
	Jalalpore	Eroo	Hybrid	13.52	21.91
		Hansapore	Local	23.15	
		Pethan	Local	29.07	
	Gandevi	Amalsad	Hybrid	12.22	14.13
		Sonwadi	Local	19.81	
		Pathri	Hybrid	10.37	
	Chikhli	Nandarkha	Local	22.03	21.72
		Samroli	Local	24.63	
		Majigam	Hybrid	18.52	
	Vansda	Vanarasi	Hybrid	9.62	19.81
		Kambova	Hybrid	18.70	
		Bhinar	Local	31.11	

Fig.1 Prevalence of Alternaria leaf spot disease of Brinjal in different taluks of Navsari district during *kharif* 2019-20



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