



Research Article

SURVEY FORWILT OF CHILLI: A THREAT TO CHILLI CROP IN NORTHERN KARNATAKA

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Abstract- Wilt is an important disease of chilli crop causing significant reduction in yield. Roving survey was conducted to know the severity of wilt disease in Belagavi, Gadag and Haveri districts during 2014-15. Disease severity was assessed in per centages at green stage and percent incidence of the disease was recorded. The overall disease severity was ranged from 5.45 to 95.00 percent. The highest incidence of wilt disease was noticed in fields of Hirehalli village (95.00%) in Haveri district whereas; least incidence of the disease was recorded at Nandikurli village (5.45%) in Belagavi district. The highest district mean of the disease incidence was recorded in Haveri (73.50%) followed by Gadag (53.00%) and Belagavi (41.57%). This reveals predominance presence of the wilt disease as a major constraint to chilli cultivation.

Keywords- Chilli, Survey, wilt, disease incidence

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Introduction

Chilli (*Capsicum annuum* L.) is one of the important commercial crops in India. Chilli is used for different purposes such as vegetable, spice, condiments, sauce and pickles. Chilli is a tropical and subtropical crop, is one of the major vegetable and spice crops grown in the country and is popularly known as wonder spice. In India Chilli occupies an area of 840 thousand hectares with an annual production of 2096M.tonnes. In Karnataka green chilli occupies an area of 45.43 thousand hectares with production of 607.94 Mtonnes [1]. It suffers from many biotic and abiotic factors affect the productivity of the chilli. Among the biotic factors, numerous fungal, bacterial, nematodes and virus result into devastating diseases which deteriorate the quality and quantity of the produce and are often difficult to control [2]. Wilt diseases are caused by major fungal pathogens *Fusarium oxysporum* f. sp. *capsici*, *Sclerotium rolfsii* Sacc, *Rhizoctonia solani* Kuhn and bacterial pathogen *Ralstonia solanacearum* (E. F. Smith) Yabuuchi *et al.* All these wilt pathogens causes severe crop losses alone or when they are associated with root knot nematode, Meloidogyne spp. Amongst the wilt diseases of chilli, *Fusarium oxysporum* f. sp. *capsici*, has become a major problem in chilli cultivation throughout Karnataka. This disease is distributed throughout the tropics and is very common in Karnataka. Wilt causes 10-50 percent crop losses around the world and 10-80 percent in India [2]. The occurrence of the disease was first reported from New Mexico as early as 1919 as a rapid wilt. The wilt appears both in seedling and later stage but the highest mortality occurs at flowering and fruiting stage, as a result whole plant wilts leading to a complete loss [Fig-1]. The plants exhibit symptoms such as leaf chlorosis, vascular discoloration and wilting of plants. Although the disease first appears in patches in a field, it can extend to the entire field if chilli is cultivated repeatedly in the same field loss [Fig-2]. High temperature and high moisture were conducive to symptom development of wilt [3].

Material and methods

Roving survey was conducted to know the severity of *Fusarium oxysporum* f. sp. *Capsici*, in northern parts of Karnataka i.e., Belagavi, Gadag and Haveri districts during 2014-15. In each district two talukas were surveyed for the wilt disease. Per

cent incidence of the disease was recorded in each field and averaged for each village. The plants showing symptoms of Fusarium wilt such as yellowing and wilting in younger leaflets, stunting and yellowing of older leaves, brown vascular discoloration of the collar portion of plants were identified and recorded [Fig-3]. Percent disease incidence was assessed by counting the number of affected plants out of the total plants. The percent disease incidence will be recorded based on formula.

$$\text{Percent disease index (PDI)} = \frac{\text{Number of infected plants}}{\text{Total number of plants observed}} \times 100$$

Results and Discussion

The survey results revealed that the disease was severe in the three districts surveyed during 2015. Data on disease incidence was taken from each visited locations in each district by considering the infected plants to the total number of plants. The data revealed that, among the 22 locations surveyed, the overall disease incidence recorded was ranged from 5.45 to 95.00 percent. The highest disease incidence (95.00 %) of wilt was noticed in fields of Hirehalli village in Haveri district. Whereas, least (5.45 %) incidence of the disease was recorded at Nandikurli village in Belagavi district. The highest district mean of the disease incidence was recorded in Haveri (73.50%) followed by Gadag (53.00%) and Belagavi (41.57%) (Table.1). The incidence of this disease varied from locality to locality, variety grown, inoculum load and environmental condition prevailing in different localities. The details of cultivation practices of the crop, followed by farmers were collected with the objective of understanding the disease incidence, which in turn will help in managing the disease to certain extent. One of the major differences observed in cultivation practices is the use of the raised bed system adapted in Raybag taluk, where comparatively less disease incidence was observed. Where as in Haveri and Ranebennur majority of the farmers adopted ridge and furrow system. The flooding type irrigation leads to high chances of wilt infection irrespective of the season. During the survey period, the high soil moisture and very high temperature was observed in Haveri district, which became favorable condition for the wilt disease occurrence.

Table-1 Survey for wilt of chilli in northern Karnataka

District	Taluk	Village	Variety	PDI (%)
Belagavi	Gokak	Konnur	PusaJwala	48.70
		Kallolli	Garima	49.32
		Arabhavi	PusaJwala	58.50
		Sangankeri	PusaJwala	65.00
		Tukkanatti	Local	48.80
	Raybag	Kankanwadi	Sankeshwar local	42.50
		R.Grameen	Raibag local	28.50
		Nandikurli	Local	5.45
		Nasalapur	Raibag local	32.8
		Mekhali	Local	35.8
	Average			41.57
Gadag	Shirahatti	Laxmeshwar	PusaJwala	48.20
		Govanakoppa	ByadagiKabbi	55.00
	Naragund	Naragund	ByadagiKaddi	45.20
		Jagapur	ByadagiDabbi	55.40
	Gadag	Gadag	ByadagiKabbi	65.30
		Hulkoti	ByadagiDabbi	47.60
		Betageri	ByadagiDabbi	55.50
	Average			53.00
Haveri	Haveri	Devihosur	ByadagiDabbi	75.90
		Devagiri	ByadagiKaddi	65.00
		Hirehalli	ByadagiKaddi	95.00
	Ranebennur	Ranebennur	ByadagiDabbi	68.50
		Hanumanahatti	ByadagiDabbi	63.50
	Average			73.50



Fig-1 Wilting of chilli plant



Fig-2 Field view showing wilting of chilli plants in patches

Repetition of crop in the same field was also observed and this leads to build up of inoculums in the field and thereby high disease incidence was recorded. The disease information of the study on incidence and severity agreed with the reviewed literature. *F. oxysporum* was reported to cause not only wilting and fruit rot but also reduced plant growth rate and yield in chilli [4]. Studied that *Fusarium* wilt, became more serious in chilli growing tracts of India [5] particularly in Karnataka in black cotton soil leading up to 25 percent yield loss [6]. Extensive field survey was conducted in five major vegetable growing areas of Kashmir valley and found that *Fusarium* wilt disease was can occur in nursery during transplantation but the maximum wilt incidence can be noticed during flowering and also in fruiting stage [7].



Fig-3 Field observation and recording plants showing wilt of chilli

Conclusion

The overall survey for wilt disease revealed that growing chilli continuously in the same field without crop rotation throughout the year for seed or dry or vegetable purpose will help the pathogen to survive on host. Hence there is need to avoid monoculture and to take pre sowing treatments to evade disease and adaptation of crop rotation with non-host crops is more important to combat disease.

Application of research: Field survey reveals predominance presence of the wilt disease as a major constraint to chilli cultivation

Research Category: Vegetable Science

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