



Survey for the Incidence of Fusarium Wilt of Coriander in Latur, Osmanabad and Beed Districts of Maharashtra

Kamala Rani Bammidi^{1*} and B. P. Dandnayak¹

¹Department of Plant Pathology, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani 431402, Maharashtra, India.

Authors' contributions

This work was carried out in collaboration between both authors. Author KRB designed the study, performed the statistical analysis, wrote the protocol, and first draft of the manuscript. Author BPD managed the analyses of the study and managed the literature searches. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2018/42513

Editor(s):

- (1) Marco Trevisan, Professor, Institute of Agricultural Chemistry and Environmental Research Centre BIOMASS, Faculty of Agriculture, Catholic University of the Sacred Heart, Italy.
- (2) Abhishek Naik, Technology Development Department - Vegetable Crops, United Phosphorus Limited -Advanta, Kolkata, India.

Reviewers:

- (1) Satya S. S. Narina, Virginia State University, USA.
- (2) R. Mahalakshmi, India.

Complete Peer review History: <http://www.sciencedomain.org/review-history/25059>

Original Research Article

Received 24th March 2018
Accepted 6th June 2018
Published 8th June 2018

ABSTRACT

The research experiment was conducted in three districts of Marathwada region on Fusarium wilt of coriander in college of agriculture, department of plant pathology. A roving survey of coriander wilt was conducted in coriander growing areas during kharif, 2016-2017 in Latur, Osmanabad and Beed districts to assess coriander wilt incidence. A total of 38 locations were surveyed in three districts. The results showed a range of disease incidence between 8 to 24%. The mean lowest wilt incidence was observed in Latur district (11.42%) followed by Beed (13.71%) and Osmanabad (17.09%). During the survey it was observed that the incidence of wilt was higher at seedling stage.

Keywords: Coriander; survey; Fusarium wilt; *F. oxysporum f. sp. corianderi*.

*Corresponding author: E-mail: kamalaranibammidi@gmail.com;

1. INTRODUCTION

India is the largest producer, consumer and exporter of seed spices in the world and hence it is known as the land of spices. According to the Spices Board of India, 52 spices are grown in the country. Share of spices in total agricultural exports of India is around 6 per cent and its share in world spices trade is 45-50 per cent by volume and 25-30 per cent by value. After cumin, coriander is the second most important seed spice with respect to exports and getting foreign exchange earnings [1].

Coriander (*Coriandrum sativum* L.) popularly known as “*dhania*” is one of the oldest seed spice used by the mankind that belong to family ‘Apiaceae’ synonym to ‘Umbelliferae’. It is the most widely used condiment through out the world and is mainly grown for its aromatic and fragrant seed which is botanically a cremocarpic fruit. The fresh green stems, leaves and fruits of coriander have a pleasant aromatic odour.

The aroma in the plant is due to an essential oil called ‘coriandrol’ which varies from 0.1 to 1.3 per cent in dry seeds. The oil of coriander seeds is an important ingredient in perfumes, cosmetic products, soup, candy, cocoa, chocolate, meat products, softdrinks and alcoholic beverages. Excellent quality of oleoresin can be extracted from coriander seed which is used for flavouring beverages, sweets, pickles, sausages, snacks, etc. Coriander bark oil has high antimicrobial properties and can be used as fungicide (Krishna De, [2]. The entire young plant is used for flavouring curried dishes of all sorts and chutney.

India is the largest producer (4.63 lakh tonnes), consumer (3.2 lakh tones) and exporter (22,660 tonnes) of coriander in the world. India accounts for approximately 80 percent of the total world Coriander production [3]. Coriander is grown commercially in Andhra Pradesh, Rajasthan, Tamil Nadu, Karnataka, Gujarat, Madhya Pradesh, Uttar Pradesh and Bihar are leading states in area and production [4].

In Maharashtra, the total area under coriander is 10,618 hectares with total production of 16,441 tonnes with an average yield of 1.548 t/ha. In Marathwada region, total area under coriander is 1680 ha with total production of 1336 tonnes [5].

The major diseases in coriander are Tumour (*Protomyces macrosporus*), Wilt (*Fusarium oxysporum* f. sp. *corianderi*) Stem rot (*Sclerotinia sclerotiorum*), Powdery mildew (*Erysiphe polygoni*) Stem-rot (*Rhizoctonia solani*) Root-rot (*Curvularia pallescens*).

Coriander wilt is a soil borne disease. Affected plants exhibit very poor and stunted growth. Root infection results in drooping of terminal shoots, followed by withering and drying of leaves. Black discoloration of vascular tissues is diagnostic symptom of the disease. Partial infection shows yellow to pink foliage as the disease progresses, plants eventually die [6].

Therefore, the present survey for wilt incidence in coriander was conducted to know the severity of disease and disease epidemics in different districts of Marathwada to adapt future crop management practices for high production with good quality.

2. MATERIALS AND METHODS

A roving survey of coriander wilt was conducted in coriander growing areas during kharif (August, September and October) 2016-2017 in three regions of Marathwada Latur, Osmanabad and Beed districts to assess coriander wilt incidence. In roving survey, 10 Km of coriander growing area for recording wilt incidence was selected in each district. These selected locations were surveyed and per cent wilt incidence was recorded by counting total number of coriander plants and number of infected plants in square meter area. Coriander plants showing typical wilting symptoms were collected in separate paper bags and brought to the laboratory for further study (cultural and morphological studies, *in vitro* evaluation of chemicals, bioagents and botanicals etc.). Observations on wilt incidence were recorded and Per cent disease incidence of wilt was calculated by using formula [7] as detailed below.

2.1 Disease Rating Scale

At growth stages: Seedling stage, flowering stage and seed maturity

Percent Disease Incidence =

$$\frac{\text{Number of plants infected by wilt}}{\text{Total number of plants observed}} \times 100$$

Table 1. Disease rating scale

Rating scale	Disease incidence (%)	Category
0	0	No symptoms of wilt
1	1	About 1% plants wilted
3	1-10	10% plants wilted
5	11-20	11-20% plants wilted
7	21-50	21-50% plants wilted
9	>51	51% or more plants wilted

2.2 Format Followed to Fill Survey Details was as Follows

1. District : -----
2. Taluka : -----
3. Village : -----
4. Farmer's name : -----
5. Area(ha) sown with coriander crop : -----
6. Variety : -----

3. RESULTS AND DISCUSSION

The survey of coriander wilt disease incidence in farmers fields of Latur, Osmanabad and Beed districts was carried out during *Kharif* 2016-2017. A total of 38 locations were surveyed in 3 districts. The results showed a range of disease incidence between 8 to 24%. The mean lowest

wilt incidence was observed in Latur district which was 11.42% followed by Beed (13.71%) and Osmanabad were 17.09% respectively. From table 3, It was observed that total number of locations surveyed in Beed district were 8 with a range of per cent wilt incidence between 8 and 16. In Latur district, total locations surveyed were 14 that were observed with a range of per cent wilt incidence between 8 to 20. A total of 22 locations were surveyed in Osmanabad district and were observed with a range of per cent wilt incidence between 8 to 24. The incidence of coriander wilt was observed in all surveyed districts. Warm temperatures with high moisture lead to more incidence of disease.

Chickpea wilt was reported at 30-35 days old seedling during December and continuation maturity and the wilt symptoms were more at seedling stage than those at maturity stage [8]. Incidence of cumin wilt caused by *Fusarium oxysporum f. sp cumini* was more in normal sown crop in comparison to late sowncrop and the incidence of disease was more at seedling stage [9]. During the surveyit was observed that the incidence of wilt was higher at seedling stage. This mightbe due to the congenial environmental conditions.

Table 2. The percent wilt incidence on coriander in farmers' fields of Latur, Osmanabad and Beed districts

District	Talukas	Village	Farmer's name	Area sown(ha)	Variety	% Wilt incidence
Beed	Majalgaon	Galalwadi	Baliram chngule	0.20	Local	12.00
		Pawerwadi	Vishnu Gurame	0.30	Local	14.00
		Pawerwadi	Shivram Mali	0.20	Local	16.00
	Parlivaijanath	Mathra	Vasanrao munde	0.20	Local	12.00
		kaudgo	Sanil Malapure	0.20	Local	10.00
		Injegaon	Ganpat Karad	0.10	Local	14.00
		Belamba	Kirtikumar Gitte	0.20	Local	10.00
		Pangan	Muchindra Phad	0.10	Local	8.00
		Average	13.7			
Latur	Chakur	Gharola	Digambar Maske	0.20	Local	8.00
		Ahmedpur	Parchanla	Kisan Kabra	0.10	Local
	Ahmedpur	Parchanla	Bhanudas Kadap	0.10	Local	8.00
		Parchanla	Ashok Dhumal	0.20	Local	10.00
		Ekatpur	Anil Gulawe	0.10	Local	12.00
	Renapur	Renapur	Anand Waghmare	0.10	Local	12.00
		Boarwati	Balagi Eidekar	0.20	Local	14.00
		Umarga	Ashok Chinte	0.10	Local	12.00
	Latur	Babalgaon	Rameshwar Patil	0.20	Local	14.00
		Selu	Mahesh Lokre	0.10	Local	20.00
		Kanhani	Kusheet Bukke	0.20	Local	8.00
		Peth	Nivarti Durnale	0.20	Local	10.00
		Sonwati	Sanjay Ratgod	0.10	Local	12.00
		Mandgaon	Bhagwan Kale	0.20	Local	10.00
Average	11.42					

District	Talukas	Village	Farmer's name	Area sown(ha)	Variety	% Wilt incidence
Osmanabad	Tuljapur	Dholai	Pravin Deshmukh	10.00	Local	10.00
		Palsap	Pandari Sarde	0.10	Local	12.00
		Ter	Rajendra Rajput	0.10	Local	10.00
		Wanewadi	Ram Paul	0.10	Local	12.00
		Ambewadi	Charan Karke	0.20	Local	12.00
		Aarni	Shivmurthi Satae	0.20	Local	18.00
		Aarni	Ekueeth Salve	0.40	Local	10.00
		Aarni	Sitaram Guvve	0.40	Local	12.00
		Tuljam	Bhalachandra Pende	0.20	Local	10.00
		Tuljam	Vital Ingle	0.10	Local	8.00
	Kakramb	Mandeo Pavit	0.10	Local	12.00	
	Kakramb	Shadishiv Kale	0.20	Local	14.00	
	Kakramb	Anna Vaidye	0.20	Local	12.00	
	Gandara	Nata Korke	0.20	Local	8.00	
	Bhdakawadi	Anand Korke	0.10	Local	8.00	
	Umerga	Bargaon	Vishwanath Patil	0.20	Local	10.00
		Jalkot	Govind Kadlinge	0.40	Local	20.00
		Kalegaon	Hasan Dhulshette	0.20	Local	22.00
		Khanapur	Maroh Gabale	0.40	Local	16.00
		Nandgaon	Chandsah Sheik	0.40	Local	24.00
		Kopegaon	Lakshman Salche	0.40	Local	16.00
	Average		17.09			

Table 3. Mean wilt incidence of coriander in surveyed district

Sl.No	District	Locations Surveyed	Range of wilt incidence%	Mean wilt incidence%
1	Beed	8	8-16	13.70
2	Latur	14	8-20	11.42
3	Osmanabad	22	8- 24	17.09
Total		44		42.22
Mean				14.07

4. CONCLUSIONS

Survey of coriander wilt incidence exercised in Latur, Osmanabad and Beed districts of Marathwada region in 38 locations showed the range of disease incidence between 8 to 24%. The mean lowest wilt incidence was observed in Latur district (11.42%) followed by Beed (13.71%) and Osmanabad (17.09%). Total number of locations surveyed in Beed district were 8 which showed a range of wilt incidence between 8.00 to 16.00%. In Latur district the total locations surveyed were 14 which showed a range of wilt incidence between 8.00 to 20.00. A total of 22 locations were surveyed in Osmanabad district showed range of wilt incidence between 8.00 to 24.00. The incidence of coriander wilt was observed in all surveyed districts. Warm temperatures with high moisture lead to more incidence of disease.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- Peter KV, Nyb, EV, Mini-Raj N. Available technologies to raise yield. The Hindu Survey of Agriculture. 2006;5:82-86.
- Krishna DA. Spice: Some known and unknown facts. Science and culture. 1999; 65:220-228.
- Ravi DS, Coriander crop survey and analysis; 2016. Nirmal Bang commodities Pvt. Ltd., Mumbai- 400 013, India.
- Anonymous. Statistical year book 'India 2016' by Ministry of Statistics and Programme Implementation; 2016, Government of India.
- Anonymous. Statistical year book 'India 2015' by Ministry of Statistics and Programme Implementation; 2015, Government of India.
- Singh AK. Integrated management of wilt, *Fusarium oxysporum* f. sp. *corianderi* of coriander. Indian J. Plant Prot. 2009; 37(2):132-133.

7. Mayee CD, Datar VV. Phytopathometry. technical bulletin-1. MAU, Parbhani, India. 1986;119-120.
8. Gangwar RK, Singh TP, Verma LN, Gupta NK, Agarwal NK. Studies on the status of chickpea wilt in Rajasthan. Agriways, 2013;1(1):38-41.
9. Deepak P, Saran L, Lal G. Control of wilt and blight diseases of cumin through antagonistic fungi under *In Vitro* and field conditions. Not. Bot. Hort. Agrobot. Cluj. 2008;36(2):91-96.

© 2018 Bammidi and Dandnayak; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sciencedomain.org/review-history/25059>