



E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 2152-2154
Received: 22-05-2019
Accepted: 24-06-2019

Tabbasum Iqbal
Division of Plant Pathology,
SKUAST-K Shalimar, Srinagar,
Jammu and Kashmir, India

Suhail Altaf
Division of Plant Pathology,
SKUAST-K Shalimar, Srinagar,
Jammu and Kashmir, India

Javeid Ahmad Dar
Division of Plant Pathology,
SKUAST-K Shalimar, Srinagar,
Jammu and Kashmir, India

Status of early blight [*Alternaria solani* (Ellis and Martin) Jones and Grouse] disease of tomato in Kashmir

Tabbasum Iqbal, Suhail Altaf and Javeid Ahmad Dar

Abstract

An extensive survey across two major tomato growing districts of Kashmir viz., Srinagar and Budgam was conducted during Kharif 2014 to record the status of the disease. In all six villages were surveyed in each district and under each village five Farmers field were surveyed w-transact. The survey conducted in both the two districts reveals that the disease was present in varying degrees of incidence and intensity at all the surveyed areas of the valley. In district Srinagar the disease incidence ranged from 11.60-59.60 per cent, and the disease intensity ranged from 5.23-41.54 per cent. While in district Budgam the disease incidence ranged from 17.60-28.80 per cent and the disease intensity ranged from 17.32-24.54 per cent. The disease was found to be prevalent in each location surveyed and on an overall basis disease incidence of 34.00 and 24.50 per cent and intensity of 23.73 and 22.40 per cent was recorded in district Srinagar and Budgam respectively. Location wise highest disease incidence (59.60) and disease intensity (41.54 %) was recorded at Shalimar. While lowest disease incidence (11.60 %) and disease intensity (5.23 %) was recorded at Hyderpora in district Srinagar. The variation in disease incidence and intensity in various locations surveyed could probably be attributed to use of susceptible varieties, high plant density leading to high relative humidity in the microclimate of the plant, high temperature during growing season besides non disposal of diseased plant material or rather neglected spray programme.

Keywords: Tomato, survey, disease, Kashmir

Introduction

Tomato (*Solanum lycopersicum* Mill.) is one of the most remunerable and widely grown vegetables in the world. It belongs to family *solanaceae*, commonly known as nightshade family include tomato, potato, chilli, pepper and eggplant (Mirza, 2007) [9]. Globally tomato is cultivated in 140 countries of the world with an annual production of 16.82 metric million tonnes (Anonymous, 2012) [1]. In India, major tomato growing states are Maharashtra, Bihar, Uttar Pradesh, Karnataka and west Bengal. The total area under crop in India is about 1204 thousand hectares with annual production of about 19402 metric tonnes which accounts for 11.5% of the total vegetable production (FAO, 2015) [5]. The productivity of tomato in India is 16 metric tonnes per hectare. The production of tomato in Jammu and Kashmir during the year 2014 was 0.008 metric million tonnes which accounts for 28.50 per cent of the total vegetable production of the State (FAO, 2014) [4]. In Kashmir it is grown commercially as well as in kitchen gardens during Kharif season.

In spite of quite favorable edaphic and environmental conditions for tomato cultivation in the Kashmir valley, the yield have not been encouraging. The wide gap between the yield potential of cultivars and the yields realized is chiefly attributed to a number of biotic and abiotic stresses (Balanchard, 1992) [2].

Yield losses due to early blight have been estimated upto to 90% in Varanasi (Panday *et al.*, 2002). The disease was reported as most destructive causing heavy losses, sometimes as high as 79 per cent in U.S, of which 20-40 per cent was due to seedling losses (collar rot) in the field (Chaerani *et al.*, 2006) [3]. Fontern (1993) [6] surveyed 14 nurseries and 67 fields of tomato in Cameroon, and reported early blight as the most destructive disease among eleven diseases found on leaves and fruits. Survey to assess tomato diseases and disorders in the main tomato growing regions of South Africa conducted indicated that 'early blight' of tomato was the most prevalent leaf disease, followed by the bacterial leaf spots (Uys *et al.*, 1996) [12]. Prasad (2002) [11] conducted a field survey in northern districts of Karnataka and reported that per cent disease index of early blight ranged between 28.60 to 65.36 per cent in tomato.

Correspondence
Suhail Altaf
Division of Plant Pathology,
SKUAST-K Shalimar, Srinagar,
Jammu and Kashmir, India

Methods and Materials

The present study was conducted during 2014-2015 in the Division of Plant Pathology, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir. To record the status of Early blight disease of tomato in Kashmir valley, extensive survey of the tomato growing areas in two districts of Kashmir valley viz., Srinagar and Budgam was carried out during the July to August in the year 2014 for ascertaining the status of early blight (*Alternaria solani*) disease of tomato (*Solanum lycopersicum*).

Six locations were taken from each district and five random tomato fields selected from each village. Two hundred fifty

plants from each field were selected for recording observation on incidence and intensity of the disease. The per cent disease incidence on leaves was calculated by using the following formula:

$$\text{Per cent disease incidence} = \frac{\text{Number of infected leaves}}{\text{Total number of leaves assessed}} \times 100$$

For recording early blight intensity, the plants were scored on 0-9 scale (Ghosh *et al.*, 2009) given below and the per cent disease intensity was calculated using the formula.

Table: Early blight scoring scale

Disease score	Score description
0	No infection
1	0-10% leaf area infected
2	10-20% leaf area infected
3	20 -30 % leaf area infected
4	30 -40% leaf area infected
5	40 -50% leaf area infected
6	50 -60 % leaf area infected
7	60 -70 % leaf area infected
8	70 -80 % leaf area infected
9	80-90% leaf area infected

Per cent disease intensity (PDI) was calculated as per following formula:

$$\text{P.D.I.} = \frac{\sum n \times v}{G \times N} \times 100$$

Where,

\sum = Summation

n = Number of diseased leaves/twigs in each Category

v = Numerical value of the category

N = Total number of leaves/twigs examined

G = Highest grade value

Results and Discussion

In the present investigations, an extensive survey of major tomato growing areas of two districts viz., Srinagar and Budgam of Kashmir valley was conducted during the year 2014 to assess the disease status of early blight (*A. solani*) of tomato. The survey conducted in both the two districts reveals that the disease was present in varying degrees of incidence and intensity at all the surveyed areas of the valley. The data regarding disease incidence and intensity recorded on leaves are presented in Table 1.

Disease incidence on leaves

The information generated during survey of the two major tomato growing districts of Kashmir during Kharif 2014 revealed the prevalence of early blight of tomato in all the districts (Table 1). The overall disease incidence was 34.0 per cent, in district Srinagar while 24.5 per cent in district Budgam, respectively. The highest disease incidence was recorded in district Srinagar where it ranged from 11.6 to 59.6 per cent, while district Budgam recorded the lowest disease

incidence ranging from 17.6 to 28.8 per cent. Location wise, the highest disease incidence (59.6%) was recorded at Shalimar in district Srinagar, while the lowest disease incidence (11.6%) was recorded at Hyderpora in same district.

Disease intensity on leaves

The disease intensity on tomato leaves recorded at various locations under survey varied considerably during Kharif 2014 (Table 2) on an overall basis, the disease intensity on leaves was 23.73 per cent, in district Srinagar, while 22.4 per cent in district Budgam respectively. The highest disease intensity was recorded in Srinagar where it ranged from 5.23 to 41.54 per cent, while district Budgam recorded the lowest disease intensity ranging from 17.29 to 24.22 per cent. Location wise the highest disease intensity (41.54%) was recorded at Shalimar in district Srinagar, while lowest disease intensity (5.23%) was recorded at Hyderpora of district Srinagar.

The preliminary survey has revealed the occurrence of early blight in most of the commercial tomato growing areas in Kashmir valley which necessitated exploring various aspects of the disease to have an effective management. The variation in disease incidence and intensity in various locations surveyed could probably be attributed to use of susceptible varieties, high plant density leading to high relative humidity in the microclimate of the plant, high temperature during growing season besides non disposal of diseased plant material or rather neglected spray programme. Prasad (2002) [11] also recorded 28.60 to 65.36 per cent intensity of early blight on tomato in northern districts of Karnataka. Kanjilal *et al.* (2000) [8] also recorded that losses due to the disease ranged from 70-100 per cent in hybrid and desk cultivars of tomato, respectively, in West Bengal.

Table 1: Disease incidence of early blight of tomato in two districts of Kashmir during kharif 2014

District	Location	*C.I at 95%		
		Disease incidence (%)	Lower limit	Upper limit
Srinagar	Shalimar	59.60	55.64	63.55
	Tailbal	39.20	34.49	43.90
	Dargah	34.80	26.83	42.76
	Noorbagh	40.20	35.57	44.82
	Batmaloo	18.60	16.40	20.79
	Hyderpora	11.60	9.49	13.70
	Mean	34.00	29.73	38.25
Budgam	Narkura	24.00	19.52	28.47
	Galwanpora	17.60	13.05	22.14
	Sabdan	24.60	22.48	26.70
	Budgam	26.00	23.22	28.77
	Chadura	28.80	26.80	30.80
	Nassarulpora	26.00	23.22	28.77
	Mean	24.50	21.38	27.68
Overall mean		29.25	25.55	32.96

* C.I=confidence interval at 95%

Table 2: Disease intensity of early leaf blight of tomato in two districts of Kashmir during kharif 2014

District	Location	*C.I at 95%		
		Disease intensity (%)	Lower limit	Upper limit
Srinagar	Shalimar	41.54	43.77	39.68
	Tailbal	27.49	32.52	22.46
	Dargah	24.44	29.70	19.17
	Noorbagh	28.98	34.58	23.71
	Batmaloo	14.70	17.14	12.26
	Hyderpora	5.23	5.44	4.95
	Mean	23.73	27.19	27.19
Budgam	Narkura	22.64	26.30	18.97
	Galwanpora	17.32	21.27	13.37
	Sabdan	24.22	25.43	23.00
	Budgam	24.54	25.40	23.67
	Chadura	22.70	23.52	21.87
	Nassarulpora	22.98	23.83	22.12
	Mean	22.40	24.29	20.50
Overall mean		23.06	25.74	23.84

*Confidence interval at 95%

References

- Anonymous. Indian Horticulture Database. National Horticulture Board, Department of Agriculture Cooperation, Ministry of Agriculture, 2012.
- Balanchard D. A colour atlas of tomato diseases. Wolfe Pub. Ltd., Brook House, London, 1992, 298.
- Chaerani R, Voorrips RE, Roeland E. Tomato early blight (*Alternaria solani*): the pathogen, genetics and breeding for resistance. Journal of General Plant Pathology. 2006; 13:335-347.
- FAO. Food and Agriculture Organization. FAOSTAT citation database results. FAO. <http://faostat.fao.org/> faostat, 2014.
- FAO. Food and Agriculture Organization. FAOSTAT citation database results. FAO. <http://faostat.fao.org/> faostat, 2015.
- Fontern DA. Survey of tomato diseases in Cameroon. Tropicultura. 1993; 11:87-90.
- Ghosh PP, Mandal D, Laha S, Dasgupta MK. Dynamics and severity model in managing fungal diseases. Journal of Plant Protection Science. 2009; 1:55-59.
- Kanjilal S, Samaddar KR, Samajpati N. Field diseases and potential of tomato cultivation in West Bengal. Journal of Mycopathological Research. 2000; 38:121-123.
- Mirza I. Tomato paste plant to be set up at Killa Saifullah. Available at <http://www.pakistan.com/english/news/newsDetail.php?newsid=15041> (accessed on 31 July, 2013), 2007.
- Pandey KK, Pandey PK, Satpathy S. Integrated management of disease, and insects of tomato, chilli and cole crops. Tech. Bull. 2002; 9:7.
- Prasad Y. Studies on variability, pre and post-harvest management of early blight of tomato. M.Sc. (Agri.) Thesis, University of Agriculture Science, Dharwad (India), 2002.
- Uys MDR, Thompson, Holz G. Diseases associated with tomato in the tomato growing regions of South Africa. Journal of Southern African Horticultural Science. 1996; 6:78-81.