



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2021; 10(3): 184-186

© 2021 TPI

www.thepharmajournal.com

Received: 12-01-2021

Accepted: 28-02-2021

Prashant AhlawatDepartment of Plant Pathology,
Chaudhary Charan Singh University,
Meerut, Uttar Pradesh, India**Vikash Kumar**Department of Plant Pathology,
Chaudhary Charan Singh University,
Meerut, Uttar Pradesh, India**Shashank Shekhar**Department of Plant Pathology,
Chaudhary Charan Singh University,
Meerut, Uttar Pradesh, India**Sudheer Kumar**Department of Plant Pathology,
Chaudhary Charan Singh University,
Meerut, Uttar Pradesh, India**Ravi Verma**Department of Plant Pathology,
Chaudhary Charan Singh University,
Meerut, Uttar Pradesh, India**Saurabh Tyagi**Department of Agriculture, School of
Biological Engineering & Life
Sciences, Shobhit Institute of Eng. &
Tech. Deemed-to-be University,
Meerut, Uttar Pradesh, India**Lalit Kumar**IIFSR, Modipuram, Meerut, Uttar
Pradesh, India**Ankur Kumar**Department of Agriculture, School of
Biological Engineering & Life
Sciences, Shobhit Institute of Eng. &
Tech. Deemed-to-be University,
Meerut, Uttar Pradesh, India**Shubham Malik**Department of Plant Pathology,
Chaudhary Charan Singh
University, Meerut, Uttar Pradesh,
India**Corresponding Author:****Prashant Ahlawat**Department of Plant Pathology,
Chaudhary Charan Singh University,
Meerut, Uttar Pradesh, India

Status of banded leaf and sheath blight of maize in western Uttar Pradesh

Prashant Ahlawat, Vikash Kumar, Shashank Shekhar, Sudheer Kumar, Ravi Verma, Saurabh Tyagi, Lalit Kumar, Ankur Kumar and Shubham Malik

Abstract

The banded leaf and sheath blight of maize is prevalent wherever maize crop is grown in all the districts Meerut, Muzaffarnagar, Shamli, Shamli Karnal road, Hapur, Bulandshahr of western Uttar Pradesh. Most of the farmers did not follow the proper crop rotation in general they grow maize crop after potato. The disease generally occurs wherever the maize crop was planted after potato because the sclerotia and infected plant debris as leftover present in soil as a primary source of inoculum.

Keywords: Banded, sheath blight, maize, western

Introduction

Maize is the 3rd most important cereal crop after rice and wheat in India. The average production of maize is 23.7 million ton and share 2.3% of total of worldwide maize production (Rajput 2014) [2]. It is grown in wide range of environment extending from semi-arid to sub humid and humid regions. Traditionally maize growing area includes plains, hills, peninsular India and nontraditional area of Andhra Pradesh. One of the major deteriorate factor to grain yield is due to the sensitivity to several diseases out of which 65 diseases are known to occur in India (Baruah 1980) [1]. Banded leaf and sheath blight is the most important disease of maize crop among different fungal diseases. It affects maize production from plating to harvesting. The disease is induced by the fungus *Rhizoctonia Solani. f. sp sasakii* and causes significant losses from 11 to 40% even 100% losses observed under congenial environmental conditions. The information on the occurrence of this disease in western Uttar Pradesh are not available so much in literature. Therefore, surveys were undertaken to achieve the prevalence status of banded leaf and sheath blight of maize in western Uttar Pradesh.

Materials and Methods: Surveys were conducted during the years 2019-2020 to collect the data on the occurrence of disease incidence and intensity, and morphology of symptoms appearance and severity in following six districts - Meerut, Muzaffarnagar, Shamli, Shamli Karnal road, Hapur, Bulandshahr of Meerut region of Uttar Pradesh. A total of sixty fields were selected randomly and from each district two locations and ten fields were examined to take the observations of the disease on maize crop of different age - 2.5 months old to up to maturity of following local varieties - Naveen, Pusa, Ageti and Gaurav. The crop was inspected for different types of symptoms appeared on - leaf, leaf sheath, flowers and ear to record the observations on the percent disease incidence and to calculate the disease index. Based on the infected area of maize plant as per disease plant area covered was also recorded for calculating the disease rating/intensity. Following key was used to access the banded leaf and sheath blight disease index.

Assessment key for banded leaf and sheath blight of maize

Table 1: Rating Scale

Symptoms Grade	Rating	% Diseased Plant Area Covered with Infection
0	0	Nil
1	5	Trace to 10%
2	15	11-20%
3	25	21-30%
4	40	31-50%
5	75	Above 50%

$$\text{Disease Index (DI)} = \frac{\text{No. of plants} \times \text{Grade}}{\text{Total no. of plant Examined}}$$

Results and Discussion

The *Rhizoctonia Solani* fungus causes infection on maize plant was observed in all the stages of crop plant- seedling, basal leaves, middle leaves, sheath, flowery and ear stage. In

different area of western Uttar Pradesh - Meerut, Muzaffarnagar, Shamli, Shamli Karnal road, Hapur and Bulandshahr, following symptoms were observed in maize crop and maximum disease severity was observed in Shamli and Shamli Karnal road.

1. Typically disease symptoms developed on basal leaves and sheath above the ground was observed:



Fig 1: Banaded leaf and sheath blight symptoms

2. The disease spread to ear and cause ear prominently characterized by light brown cottony mycelium on the ear. Cottony mycelium present on ear covering leaf

structure formed the small round raised black fattened sclerotia varied in size from 0.5 to 5 mm.



Fig 2: Leaf and sheath infection showing sclerotia

3. In advance stage particularly in those fields where maize was planted after potato the symptoms were observed commonly on sheath than leaves. The disease pattern in advance stage were generally not only seen on leaves but also prominent symptoms observed on sheath and husk.

The maximum disease incidence on 2.5 months old crop was recorded 40.31% with disease intensity of 11.65 in two locations Kajipur and Lawar in Meerut district followed by 28.56% (8.55D.I) was observed in knee height stage of maize crop. In following stage, the disease incidence was observed 38.6% (D.I 9.67 in Bulandshahr and Hapur area). It may be due to the primary source of inoculum because maize crop was planted after potato. The sclerotia and infected plant debris was present in soil as a primary source of inoculum.

The maximum incidence on maturity stage of crop was also recorded in Muzaffarnagar 49.66% (DI 15.35), Shamli 53.33% (DI 13.86), Shamli karnal road 37.86% (DI 9.63), Hapur 38.2% (DI 9.33), and Bulandshahr 70.33 (DI 16.23). The highest incidence at maturity stage in Bulandshahr was observed upto 70.33% (DI 16.23) that was due to the adopting of crop rotation by farmers as: Potato - maize fodder - maize grain - potato

However maximum disease incidence 67.76% with the (DI

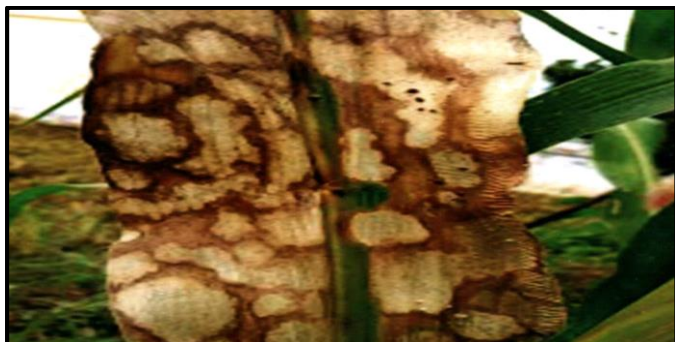


Fig 3: Typical Brown spots develops on basal leaf

12.86) was observed in Hapur area followed by 63.6% (DI 12.76) in Shamli. The occurrence of disease incidence and disease intensity in Muzaffarnagar, Shamli, Hapur,

Bulandshahr was observed due the presence of primary source of Inoculums of potato crop as grown before maize.

Table 2: Average Temperature ($^{\circ}\text{C}$) during maize growing season July-October 2019 - 2020.

Month	Meerut		Muzaffarnagar		Shamli		Karnal Road Shamli to Karnal		Hapur		Bulandshahr	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
July	33.6	26.4	32.6	24.6	34.8	27.2	35.2	27.0	31.0	25.8	33.4	25.6
Aug	34.3	24.6	33.4	23.5	33.6	24.4	36.3	26.0	33.5	24.7	34.3	26.3
Sep	33.8	24.4	33.8	24.5	34.9	23.6	34.8	24.1	31.9	23.6	33.7	24.4
Oct	37.5	31.5	31.6	22.0	32.4	20.9	33.3	21.4	31.6	22.6	31.8	22.3
Soil Type	Clay Loam		Clay Loam		Clay & Semi Loam		Clay		Clay Loam		Sandy Loam	

Table 3: Disease incidence (%) of Banded leaf and sheath blight of maize growing are of western Uttar Pradesh.

District	Location	Crop Stage	% Incidence	Disease Intensity (DI)
Meerut	Kajipur Lawar	2.5 Months Old	40.30	11.65
		Knee Height Stage	28.56	8.55
Muzaffarnagar	Morna Sukartal Pachanda	Maturity Stage	49.66 (1)	15.35
		Earning Stage	20.30	5.63
Shamli	Iank Banti Khera	Flowering Stage	63.16 (2)	12.76
		Maturity Stage	53.33	13.86
Shamli Karnal Road	Mustafa Kala Shamli Karnal Border	Knee Height Stage	36.45	10.68
		Maturity Stage	37.86	9.63
Hapur	Pakki Chowk ki Babu Garh	Maturity Stage	38.2	9.33
		Flowering Stage	67.76 (3)	12.86
Bulandshahr	Nusarka Lakhawate	Maturity Stage	70.33 (4)	16.23
		Flowering Stage (Poor Crop)	38.64	9.67

Reference

- Lal S Baruah, Butchaiah K. Assessment of Yield losses in maize cultivars due to banded leaf and sheath blight, sclerotial disease, Indian phyto Pathol 1980;29:129-132.
- Laxman Singh Rajput, Harlapur SL. Status of banded leaf and sheath blight of maize in north karnataka. J Agric. Sci 2014;27(1):82-84.
- Ahuja SC, Payak MM. Symptoms and signs of banded leaf and sheath blight in maize. Phytoparasitica 1982;10:41-49
- Akhtar J, Jha VK, Lal HC. Occurrence of Banded Leaf and Sheath blight of Maize in Jharkhand with Reference to Diversity in Rhizoctonia solani. Asian J Agri. Sci 2009;1(2):32-35.