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Evaluation of blast severity of pearl millet field in Morena and Sheopur districts of Madhya Pradesh

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Abstract
Pearl millet [*Pennisetum glaucum* (L.) R. Br)] is one of the assured Kharif crop. It is popularly known as "Bajra" grown for grain and forage. The consumption of pearl millet grain is more common in villages due to its high nutritive value. In Morena and Sheopur district of Madhya Pradesh, the blast has become an important biotic constraint.

Survey was carried out in major pearl millet growing districts of Madhya Pradesh *viz.*, Morena and Sheopur to find out the incidence of blast during July to November 2014-15. For recording disease observation, five plants were randomly selected and tagged. The observations on blast were recorded on tagged plants by using 1-9 scale. The severity of blast in the surveyed villages was in the range of 8.55% in Bhopatpur village of Joura block to 16.50% in Mebra village of Vijaypur block. The maximum severity of blast in Morena district was recorded in Porsha block 13.28%, Kailarash (13.07%), Morena (12.28%), Sabalgarh (11.57%), Pahadgarh (11.35%) and Ambah (10.57%) while a minimum of 9.48% was recorded in Joura block of Morena district. The blast severity in both the surveyed blocks of Sheopur (Karahal-14.20%, Vijaypur-15.28%) was comparatively higher than all the blocks of Morena district. The blast severity was higher in Sheopur district than Morena and it was generally higher in late sown field.

Keywords: Blast severity, pearl millet field, *Pennisetum glaucum* (L.) R. Br)

Introduction
Pearl millet [*Pennisetum glaucum* (L.) R. Br)] is one of the assured Kharif crop under environment domesticated in the annual rainfall of 150 mm to 1000 mmin India. It is popularly known as "Bajra" grown for grain and forage. The consumption of pearl millet grain is more common in villages due to its high nutritive value. India and Africa are together occupying 90 per cent area of total pearl millet production in the world (Yadav *et al*., 2012) [9].

In India**,** pearl millet is cultivated over an area of 7.4 million ha with an average production of 9.13 million tones and productivity of 1237 kg/ha during 2017-18 (Anonymous, 2019) [1]. Madhya Pradesh occupies 0.27 million ha with an annual production 0.59 million tones and productivity is 2203 kg/ha (Anonymous, 2018) [3]

It's grain is chiefly served as a food, because of high protein (27 to 32%), higher concentration of essential amino acids, twice the fat and higher gross energy than maize (Ejeta *et al*. 1987; Davis *et al*. 2003) [6, 4]. Major constraint of pearl millet cultivation are downy mildew, blast, ergot, smut and rust which attack the crop during its growth, cause low yield and economic loss. Blast incited by *Pyricularia grisea* was first reported in India from Kanpur 1953 (Mehta *et al*., 1953) [8] and remain as minor disease till the end of 20th century but from last one decade the disease has occupied a key position among the Pearl millet diseases particularly in north central region of the country specially Rajasthan, Uttar Pradesh, Madhya Pradesh, Haryana, Punjab and Delhi. Severe infection reduces fodder value considerably. Protein content of leaves is not known. The disease has occupied key position in the reduction of pearl millet fodder quality in northern Madhya Pradesh. Range of Blast percent disease Incidence from 1.0 to 50.0 on pearl millet in the Rajasthan, Madhya Pradesh Maharashtra Tamil Nadu Gujarat and Karnataka field surveys during 2014-2015.

Material and Methods
Pearl millet fields of Morena and Sheopur were surveyed to find out the severity of blast in different blocks of the district. For such survey three villages from each block were randomly selected and from each village five fields were randomly selected. The blast severity was recorded at dough stage of the crop. In each selected field the disease severity was recorded on four randomly selected patches of 1 m^2. The mean disease severity of all the four patches of the field represents the severity of the field.

The mean of all the five fields of the village will represent the severity of the village and the mean of the village of the block represents the severity of each block. The district severity was calculated by taking the mean of all the blocks of the district. For recording disease observation, five plants were randomly selected and tagged. The observations on blast were recorded on tagged plants by using 1-9 scale.

Results and Discussion

A planned survey of Pearl millet blast was carried out in all the 7 blocks of Morena district and 2 blocks of Sheopur district where Pearl Millet is most important crop. Three villages from each block and five fields from each village were randomly selected. The data presented in the table 1 reveals that blast is a commonly occurring foliar disease of Pearl millet and its severity in across the villages was in the range of 8.55% in Bhopatpur village of Joura block and 16.50% in Mebra village of Vijaypur block. In Morena district the maximum severity of b .t was recorded in Porsha block 13.28% followed by Kailarash (13.07%), Morena (12.28%), Sabalgarh (11.57%), Pahadgarh (11.35%) and Ambah (10.57%) while the minimum blast severity of 9.48% was recorded in Joura block of Morena district.The blast severity in both the surveyed blocks of Sheopur (Karahal-14.20%, Vijaypur-15.28%) was comparatively higher than all the blocks of Morena district. The maximum blast severity was recorded in Vijaypur block (15.18%) while minimum was recorded in Joura block (9.48%). The mean severity of blast in Morena district was 11.66% while 14.69% in Sheopur district (Fig.-1, Table 1).

A well planned survey of Pearl millet blast is commonly occurring foliar disease of Pearl millet. In Morena district the maximum severity of blast was recorded in Porsha block followed by Kailarash, Morena, Sabalgarh, Pahadgarh and Ambah while the minimum blast severity was recorded in Joura block of Morena district. The blast severity in both the surveyed blocks of Sheopur (Karahal, Vijaypur) was comparatively higher than all the blocks of Morena district. The maximum blast severity was recorded in Vijaypur block while minimum was recorded in Joura block. Devda (2009) [5] surveyed the pearl millet fields of Morena, Bhind and Gwalior and reported 5.5, 3.8 and 5.4 percent severity of blast respectively. Kaurav, *et al.* (2017) [7] the severity of Blast during 2015-16 and 2016-17 in the surveyed localities ranged from 1 to 5.48% and 3.6 to 13.8% respectively in major pearl millet growing districts of Madhya Pradesh *viz*., Morena, Bhind, Gwalior, Sheopur, Shivpuri, Datia, jhabua and Alirajpur. Yadav *et al.* (2012) [9] also observed pearl millet blast as an important biotic constraint in northern Madhya Pradesh and reported that the average severity of blast in Morena, Bhind and Gwalior was 11.53, 13.40 and 11.28 percent respectively. The severity of pearl millet blast in northern Madhya Pradesh during 2006 was in the range of 1-10 per cent, respectively (Anonymous, 2006) [2].

Table 1: Block wise severity of Pearl millet blast in Morena and Sheopur district.

District-: Morena	Location	Percent Blast Severity					
		F_1	F_2	F_3	F_4	F_5	Mean
Block Sabalgarh	V1.Rampahadi	9.75	6.50	12.75	16.00	10.50	11.10
	V2.Kemara Kalan	11.75	15.25	10.00	13.75	14.5	13.00
	V3.Bakashpur	8.75	6.50	8.00	17.25	12.5	10.60
	B1. Mean%						11.57
Block Kailarash	V1.Patelkapura	9.75	14.75	18.75	10.25	11.75	13.05
	V2.Arroda	13.50	9.75	7.75	16.25	18.75	13.20
	V3.Jhonakapura	15.75	6.50	14.25	16.50	11.75	12.95
	B2. Mean%						13.07
Block Joura	V1.Tharra	9.25	13.75	10.25	4.75	7.25	9.05
	V2.Urhera	12.75	11.25	8.50	15.25	6.50	10.85
	V3.Bhopatpur	10.25	4.50	8.50	12.25	7.25	8.55
	B3. Mean%						9.48
Block Pahadgarh	V1.Sikroda	11.25	10.50	17.25	14.75	13.50	13.45
	V2.Dhurkuda	8.50	5.50	11.75	13.50	6.50	9.15
	V3.Beharara Gajir	13.5	15.25	10.50	6.50	11.50	11.45
	B4. Mean%						11.35
Block Morena	V1.Morena Goan	4.75	12.50	8.75	15.25	6.75	9.6
	V2.Mudiya kheda	6.50	16.75	13.25	12.50	15.75	12.95
	V3.Gopalpura	15.25	18.75	13.75	9.25	14.5	14.30
	B5. Mean%						12.28
Block Ambah	V1.Bareh	12.25	8.75	6.50	16.75	13.75	11.60
	V2.Banka Pura	15.00	5.75	8.75	7.25	8.25	9.00
	V3.Khirenta	12.5	10.50	4.25	14.75	13.50	11.10
	B6. Mean%						10.57
Block Porsha	V1.Senthra	19.25	14.75	8.75	16.25	17.50	15.30
	V2.Prathipura	16.00	13.50	7.50	10.75	12.25	12.00
	V3.Dhaneta	15.75	8.75	11.25	17.50	9.50	12.55
	B7. Mean%						13.28
District Mean%							11.65
District-: Sheopur							
Block Karahal	V1.Goras	9.50	18.75	12.50	16.75	14.75	14.45
	V2.Heerapura	21.50	17.25	15.75	10.25	14.75	15.9
	V3.Jakhda	12.3	14.25	10.75	7.50	16.50	12.25
	B1. Mean%						14.20
Block Vijaypur	V1.Syampur	12.75	15.50	9.25	22.75	18.75	15.8
	V2.Harkue	12.75	18.75	15.25	11.75	7.75	13.25
	V3.Mebra	14.75	17.25	21.50	10.75	18.25	16.5

	B2. Mean%	15.18
District Mean%		14.69
All of district Mean%		12.33

B – Block, V – Village, F – Field

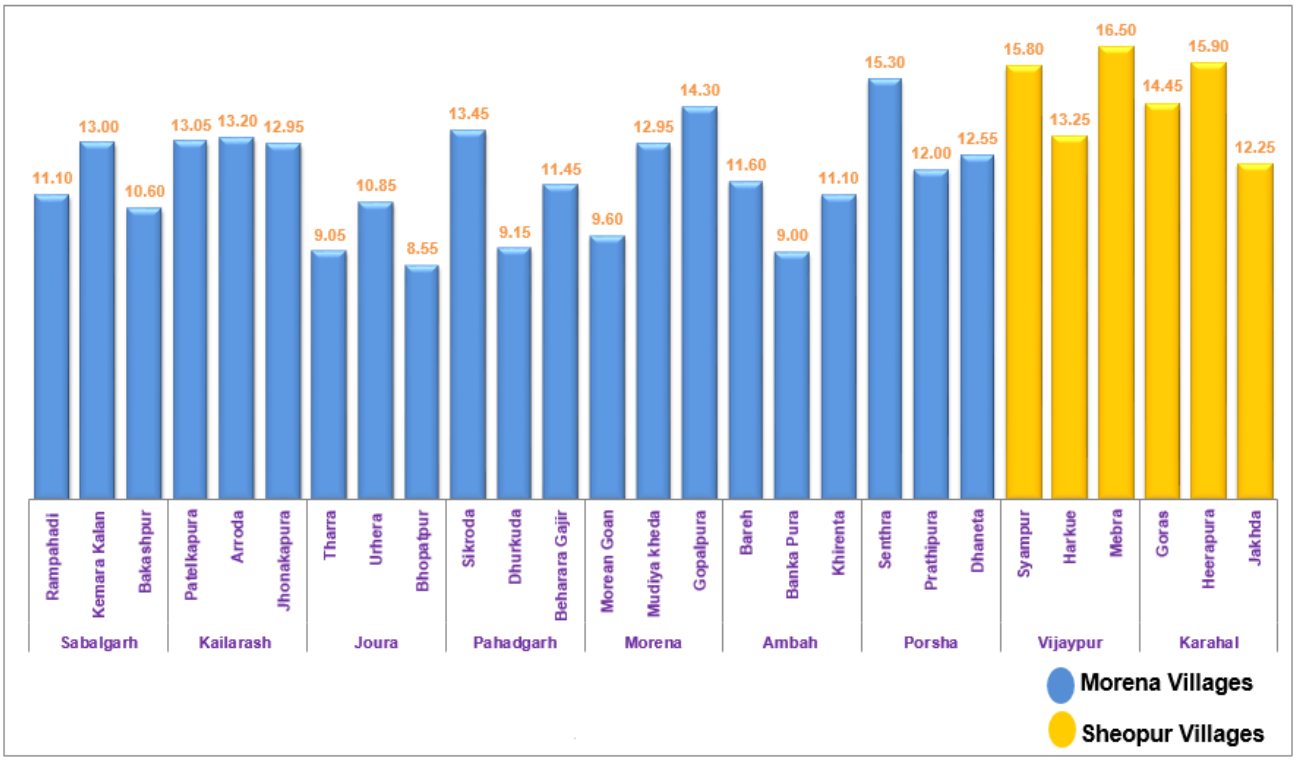

Fig 1: Village wise severity of Pearl millet blast in the blocks of Morena and Sheopur districts.

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