

Survey for Incidence and Severity of Blast of Rice in Upland Areas of Northern Karnataka

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Received 22 June 2022, Accepted 9 September 2022, Published on 10 November 2022

ABSTRACT

Rice (*Oryza sativa* L.) is one of the most important cereal crops grown in India. Rice blast disease caused by *Pyricularia grisea* is one of the most important diseases of rice. *Pyricularia grisea* causes heavy loss to rice in every year in India. Blast is more severe in upland areas. So, an intensive fixed plot survey was carried out during *kharif* in upland rice fields of Belgaum, Dharwad and Uttara Kannada districts of Northern Karnataka to know disease incidence and severity of blast disease in those areas. The data revealed that both the disease incidence and severity were in low to high level in areas surveyed. Higher disease incidence and severity were noticed in Haliyal and Mundgod talukas of Uttara Kannada District.

Keywords Blast, *Pyricularia grisea*, Survey, Disease incidence, Severity.

INTRODUCTION

Rice (*Oryza sativa* L.) is one of the most important cereal crops. It is a staple food crop of 60% of world's population. It is one of the important staple food crops

of India, which stands second with regard to area and production amongst the rice growing countries in the world. Out of 782 million tons (mt) of global rice production from 167.1 million hectares (m ha), India produced 116.42 m t in 44.5 m ha (GoI 2020). Rice suffers from many diseases caused by fungi, viruses, bacteria, phytoplasmas and nematodes. Blast caused by (*Pyricularia grisea*) is generally considered as the major disease of rice, because of its wide spread distribution and its destructiveness under favourable conditions. The infection due to neck blast causing pathogen was reported to cause more than 50% yield loss (Shim *et al.* 2005). In India it was estimated that yield loss due to blast of rice could be as high as 50% when the disease attains an epidemic proportion (Lavanya and Gnanamanickam 2000). Crop loss studies indicated that yield loss in case of highly susceptible variety viz., HR-12 and moderately susceptible variety viz., Intan were estimated to the extent of 51.54 and 24.89%, respectively (Hossain and Kulkarni 2014). Blast disease is endemic in Karnataka and mainly severe in upland areas and takes heavy toll of the crop, hence survey for the incidence of blast of rice is considered to be essential in upland areas. This information would be useful for locating 'hot spots' and also assess the loss in yield.

MATERIALS AND METHODS

Rice is one of the main *kharif* crops of Dharwad and adjoining districts and is grown mainly under rainfed conditions. An intensive fixed plot survey was conducted during *kharif* (August to November) on the incidence and severity of the blast in rice growing upland areas. Rice fields of two talukas of Dharwad (Dharwad and Kalghatgi), two of Uttara Kannada

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Table 1. Survey for the incidence and severity of blast of rice caused by *Pyricularia grisea*.

District	Taluka	Village	Per- cent disease incid- ence	Leaf blast seve- rity (percent)		
Dharwad	Dharwad	Honnapur	30	9.23		
		Kalkeri	35	12.31		
		Mugad	65	20.20		
		Nigadi	68	21.10		
		Tegur	62	24.23		
	Kalghatgi	Dumawad	43	18.41		
		Jodalli	36	15.23		
		Kolkhatgi	51	18.84		
		Belgaum	Bailhongal	Basapur	60	17.10
				Channapur	50	13.21
Bailhongal	40			11.12		
Uttara Kannada	Haliyal	Havagi	61	30.23		
		Murkwad	54	23.12		
		Thergaon	70	33.24		
	Mundgod	ARS, Mund- god	ARS, Mund- god	33	10.23	
			Indoor	66	31.14	
			Koppa	63	25.60	

(Mundgod and Haliyal) and one of Belgaum (Bailhongal) districts were surveyed. In each taluka, three villages were selected for survey except Dharwad Taluka, where five villages were surveyed and in each village five fields were selected. In each field, five spots of one square meter area were selected randomly. The disease severity were recorded based on 0-9 scale (standard evaluation system for rice) and then the per cent disease index was calculated (Mayee and Datar 1986).

The per cent disease incidence was recorded by using the following formula :

$$\text{Percent disease incidence} = \frac{\text{Number of plants infected}}{\text{Total number of plants observed}} \times 100$$

Leaf blast disease severity was calculated by using the following formula.

$$\text{PDI} = \frac{\text{Sum of individual ratings}}{\text{Number of leaves assessed}} \times \frac{100}{\text{Maximum disease grade value}}$$

RESULTS AND DISCUSSION

A fixed plot survey was conducted for blast of rice during *khari* in different villages of Dharwad, Belgaum and Uttara Kannada Districts of Northern Karnataka to know the incidence and severity of blast disease in farmers' fields. The data pertaining to this study are given in Table 1. The survey indicated that, the disease incidence recorded in different localities was low to high level. Higher incidence (above 60%) was recorded in Thergaon (70%), Nigadi (68%), Indoor (66%), Mugad (65%) Koppa (63%), Tegur (62%), Havagi (61%) and Basapur (60%) and moderate incidence (ranged between 40-60%) was noticed at Murkwad (54%), Kalghatgi (51%), Channapur (50%), Dumawad (43%) and Bailhongal (40%) and lower incidence (below 40%) was observed at Honnapur (30%), ARS, Mundgod (33%), Kalkeri (35%) and Jodalli (36%). Maximum disease incidence was noticed in Haliyal (61.66%) and Mundgod (54%) talukas of Uttara Kannada. Disease severity (leaf blast) was low to higher level in different localities. Disease severity was higher (above 30%) at Thergaon (33.24%), Indoor (31.14%) and Havagi (30.23%) villages. The disease severity was moderate (ranged between 15-30%) at Koppa (25.60%), Tegur (24.23%), Murkwad (23.12%), Nigadi (21.10%), Mugad (20.20%), Kalghatgi (18.84%), Dumawad (18.41%), Basapur (17.1%) and Jodalli (15.23%) vil- lages. Disease severity was low (below 15%) at Hon- napur (9.23%), ARS Mundgod (10.23%), Bailhongal (11.12%), Kalkeri (12.31%) and Channapur (13.21%) villages. Maximum disease severity was noticed in Haliyal (28.66%) taluka followed by Mundgod (22.32%) taluka of Uttara Kannada and least disease severity was recorded in Bailhongal (13.81%) taluka of Belgaum District. The data on the survey revealed that the incidence and severity of the disease varied from locality to locality because of type of variety, inoculum load, environmental conditions, date of sowing and type and amount of fertilizers applied.

Both the disease incidence and severity were in low to high level in the areas surveyed. Maximum disease incidence and severity were recorded in Haliyal and Mundgod talukas of Uttara Kannada District may be due to growing susceptible variety. Variation in the disease incidence may be due to availability of potential inoculum, host and environment.

REFERENCES

- GoI (Government of India) (2020) First advance estimates of production of food grains for 2019-20. Directorate of Economics and Statistics. Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, New Delhi.
- Hossain MM, Kulkarni S (2014) Assessment of loss due to blast disease of rice. *J Interacademia* 18 : 218—221.
- Lavanya B, Gnanamanickam SS (2000) Molecular tools for characterization of rice blast pathogen (*Magnaporthe oryzae*) population and molecular marker assisted breeding for disease resistance. *Curr Sci* 78 (3) : 248—257.
- Mayee CD, Datar VV (1986) Phytopathometry, Marathwada Agricultural University, Parbhani, pp 26—27.
- Shim HS, Hong SJ, Yeh WH, Han SS, Sung JM (2005) Damage analysis of rice panicle blast on disease occurrence time and severity. *Pl Pathol J* 21 (2) : 87—92.