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Survey on the disease incidence and index of sheath rot of rice in hilly and coastal zones of Karnataka

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Abstract

Roving survey conducted during *Kharif* 2020-2021 revealed that the percent disease incidence ranged from 12.35 to 29.65 percent whereas percent disease index ranged from 9.45 to 27.65 percent. The highest percent disease incidence (29.65%) and index (27.65%) was noticed at AHRS, Ponnampet in Kodagu district whereas least percent disease incidence (12.35%) and index (9.45%) of the disease was recorded at Sidlipura village in Shivamogga district. The average highest disease incidence and index of 23.84 and 26.21 percent, respectively was recorded in Kodagu district. The lowest disease incidence and index of 18.30 and 15.70 percent, respectively was recorded in Shivamogga district. During *Kharif* 2021-22 percent disease incidence ranged from 14.56 to 32.85 percent whereas, percent disease index ranged from 12.54 to 30.25 percent. The highest percent disease incidence and index (32.85 and 30.25%, respectively) of sheath rot was noticed in fields of AHRS, Ponnampet in Kodagu whereas least percent incidence and index (13.54 and 11.25%, respectively) was recorded in Agasavalli village of Shivamogga district. The mean maximum percent disease incidence (28.43%) and index (26.15%) was noticed in Kodagu district, whereas mean minimum percent disease incidence (19.63%) and index (17.90%) was observed in Shivamogga district.

Keywords: Sheath rot, percent disease incidence, percent disease index, *Kharif*

Introduction

Rice (*Oryza sativa* L.) is the most important cereal crop and provides staple food for more than half of the world's population. Increase in population is demanding more rice production and productivity. Under field condition, the productivity of rice is affected by many biotic and abiotic factors. The cultivation of rice is changed over the decades from a simple cultivation practices to the advanced cultivation to increase yield. Increased in rice yields especially after 1960s is mainly due to the introduction of high yielding semi-dwarf varieties which requires more inputs like chemical fertilizers, water and other resources. As a result, India achieved self-sufficiency in rice and currently producing more than 115 MT of rice to meet country's demand. A number of biotic and abiotic stresses emerged as major constraints for rice cultivation in diverse agro-climatic conditions and growing ecologies. Diseases are the major biotic constraints to rice which can reduce the yields by 20-100 percent based on severity. Major diseases like blast, brown spot, bacterial blight, sheath blight and tungro still causing more damage and new minor diseases like false smut, grain discoloration, early seedling blight, narrow brown spot and sheath rot have emerged as major problems. Keeping this in view, the present investigations were undertaken to survey for disease severity of sheath rot of rice from hilly and coastal zones of Karnataka.

Material and Methods

Roving method of survey was followed to assess the incidence and index of sheath rot. The survey conducted during *Kharif* 2020-2021 and 2021-2022 in total of 20 taluks from six districts namely Chikkamagaluru, Dakshina Kannada, Hassan, Kodagu, Shivamogga and Udupi. In field, plants were selected in zig-zag manner and the index of sheath rot of rice was recorded by following 0-9 scale of standard evaluation system for rice scale (IRRI, 2006) [2].

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

Based on the grades recorded in the field, percent disease index (PDI) was calculated by using the formula given by Wheeler (1969) [5].

For PDI calculation, 10-15 random tillers were selected, then individual ratings was given according to the incidence. Sum of these individual ratings will be calculated by using the above formula.

$$\text{Percent disease index (PDI)} = \frac{\text{Sum of the individual disease ratings}}{\text{Total number of leaves observed} \times \text{maximum disease grade}} \times 100$$

Results and Discussion

In all the areas surveyed, rice was grown in red loamy and red laterite soil under irrigated condition. During *Kharif* 2020-21, the percent disease incidence ranged from 12.35 to 29.65 percent whereas percent disease index ranged from 9.45 to 27.65 percent (Table 1).

Among the villages surveyed, the highest percent incidence and index (29.65% and 27.65%, respectively) of sheath rot was noticed in fields of AHRS, Ponnampet village in Kodagu district followed by Bettathur village of Madikeri district (29.65% and 26.54%, respectively) whereas least percent incidence and index (12.35% and 9.45%, respectively) of the disease was recorded at Sidlipura village in Shivamogga district. In Chikkamagaluru district, the average disease incidence (22.38%) and index (19.50%) and was in the range of (16.83%) and (14.25%) in Kelakoppa to (23.24%) and (25.56%) in Kanur. In Dakshina Kannada district, the average disease incidence and index of (24.88%) and (22.47%) and

was in the range of 20.53 and 18.33 percent, respectively in Aithikaribettu to 27.21 and 25.21 percent, respectively in Shimanthoor. In Hassan district, the average disease incidence (19.02%) and index (16.97%) and was in the range of 13.21 and 11.23 percent, respectively in Dakshinanala to 25.35 and 22.25 percent, respectively in Baikere. The average disease incidence (26.21%) and index

(23.84%) in Kodagu district and was in the range of 23.52 and 20.23 percent, respectively in Kushalanagar to 29.65 and 27.65 percent, respectively in Ponnampet, while in Shivamogga district the range was (9.45%) and (12.35%) in Sidlipura to (22.56%) and (20.12%) percent in Ayanuru with average district disease incidence and index of 18.30 and 15.70 percent, respectively. In Udupi district, the average disease incidence and index of 23.77 and 21.77 percent, respectively and was in the range of (21.45%) and (18.23%) in Aloor to (27.13%) and (25.23%) in Manoor (Table 1).

Out of 20 taluks, the mean maximum disease incidence (26.74%) and disease index (24.40%) was noticed in Ponnampet taluk followed by Madikeri taluk disease incidence (26.40%) and index (23.80%) of Kodagu district. Least mean percent disease incidence (17.24%) and disease index (14.85%) was noticed in case of Bhadravati taluk of Shivamogga district. Among the different districts surveyed, the mean maximum percent disease incidence (26.21%) and disease index (23.84%) was noticed in Kodagu district whereas mean minimum percent disease incidence (18.30%) and disease index (15.70%) was observed in Shivamogga district.

Table 1: Survey for the incidence and index of sheath rot of rice in hilly and coastal zones of Karnataka during *Kharif* 2020-21

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease incidence	Percent disease index	Other diseases observed
Chikkamagaluru	Mudigere	Banakal	13.14	75.54	Red loamy soil	KPR 1	24.22	20.52	Brown leaf spot
		Jogannanakere	13.08	75.63	Red loamy soil	Tunga	21.23	18.56	Blast
		Samse	13.19	75.33	Red loamy soil	Hemavathi	18.45	15.53	Brown leaf spot, Grain discolouration
		Kalasa	13.23	75.35	Red loamy soil	Sayadri kempu mukti	23.42	21.25	Blast, Smut
		Mean					21.83	18.96	
	Narasimharajapura	Balehonnuru	13.34	75.46	Red loamy soil	MTU-1001	23.41	19.54	Brown leaf spot
		Aralikoppa	13.78	75.68	Mixed soil	KHP-11	25.23	22.54	Blast
		Kannur	13.61	75.46	Red loamy soil	IET Sanna batta	25.56	23.24	Brown leaf spot
		Muttinakoppa	13.72	75.46	Red loamy soil	JGL-24423	24.58	21.54	Blast, Grain discolouration
		Mean					24.69	21.71	
	Shringeri	Asanabalu	13.48	75.18	Red loamy soil	Holesalu	18.65	15.23	Sheath blight, Smut
		Dharekoppa	13.45	75.22	Red loamy soil	Tunga	21.45	18.42	Brown leaf spot
		Kelakoppa	13.47	75.27	Mixed soil	Ratnachudi	16.83	14.25	Blast, Grain discolouration
		Markal	13.20	75.49	Red loamy soil	Intan	25.55	23.42	Blast, Udabatta
		Mean					20.62	17.83	
	District Mean					22.38	19.50		
	Dakshina Kannada	Mangaluru	Aithikaribettu	13.10	74.81	Red laterite soil	Tunga	20.53	18.33
Amblamogru			12.83	74.89	Red laterite soil	Sayadri kempu mukti	23.52	20.23	Smut, Grain discolouration

	Badagayekkar	13.04	74.86	Red loamy soil	Jaya	26.12	23.52	Blast
	Shimanthoor	13.07	74.83	Alluvial soil	Intan	27.21	25.21	Brown leaf spot
	Mean					24.32	21.82	

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease incidence	Percent disease index	Other diseases observed
Dakshina Kannada	Puttur	Kabaka	12.79	75.15	Red laterite soil	Jaya	24.23	21.53	Brown leaf spot
		Kodimbady	12.80	75.21	Red laterite soil	Mo-21	26.23	23.56	Blast
		Madnoor	15.03	74.84	Red loamy soil	Mo-4	28.54	24.65	Blast
		Nidpalli	12.65	75.21	Red laterite soil	Jaya	24.52	22.65	Blast, Smut
		Mean					25.88	23.09	
	Sullia	Aletty	12.53	75.38	Red laterite soil	Intan	26.83	24.54	Brown leaf spot
		Bellare	12.66	75.36	Red laterite soil	Mo-21	25.15	23.56	Brown leaf spot, Grain discoloration
		Markanja	12.56	75.50	Red loamy soil	Kajji akki	23.54	21.45	Blast, Smut
		Murulya	12.68	75.41	Red loamy soil	Intan	22.32	20.56	Smut, Grain Discoloration
		Mean					24.46	22.52	
	District Mean					24.88	22.47		
Hassan	Belur	Chikkole	13.11	75.88	Red soil	Sharavathi	16.54	14.53	Blast, Sheath Blight
		Hiruguppe	13.09	75.95	Red soil	Hemavathi	18.52	16.36	Smut, Grain discoloration
		Hosahalli	13.53	77.24	Red soil	Jaya	22.54	20.65	Blast, Smut
		Keraluru	13.04	75.91	Red soil	Karna	17.52	15.25	Sheath Blight, Grain discoloration
		Mean					18.78	16.69	
	Holenarsipura	Anekannambadi	12.64	76.29	Red soil	KHP 5	22.21	20.56	Brown leaf spot
		Bagivalu	12.81	76.24	Red soil	Mangala	19.23	16.42	Brown leaf spot
		Dakshinanala	12.79	76.22	Red soil	MTU-1010	19.26	17.32	Blast, Smut
		Maragowdanahalli	12.80	76.17	Red soil	RNR-15048	13.21	11.23	Grain discoloration, Smut
		Mean					18.47	16.38	
	Sakleshpura	Baikere	12.96	75.78	Red soil	IET-24451	25.35	22.25	Brown leaf spot, Grain discoloration
		Lakkunda	13.03	75.85	Red soil	IR-64	22.43	20.55	Blast
		Hanjagondanahalli	13.02	75.68	Red soil	Jayashree	17.25	16.28	Sheath Blight, Smut
		Hethur	12.79	75.78	Red soil	RNR-15048	14.26	12.32	Blast, Smut
		Mean					19.82	17.85	Sheath Blight, Grain discoloration
		District Mean					19.02	16.97	

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease incidence	Percent disease index	Other diseases observed
Kodagu	Madikeri	Avanduru	12.41	75.67	Red laterite soil	KPR-2	25.62	23.81	Blast, smut
		Bettathur	12.40	75.66	Red laterite soil	BPT-5204	29.65	26.54	Blast
		Hoddur	12.31	75.72	Red laterite soil	Tunga	27.54	24.53	Brown leaf spot, Grain discoloration
		Madikere	12.42	75.73	Red laterite soil	Hemavathi	24.21	20.35	Blast, Smut
		Mean					26.40	23.80	
	Ponnampet	AHRS Ponnmpet	12.14	75.93	Red laterite soil	BPT-5204	29.65	27.65	Brown leaf spot, Smut
		Bekkesodluru	12.10	75.98	Red laterite soil	MTU-1001	26.65	24.36	Brown leaf spot
		Kirugoor	12.13	75.99	Red laterite soil	Tunga	25.12	22.36	Brown leaf spot, Grain discoloration
		Halliattu	12.15	75.91	Red laterite soil	KPR-2	25.55	23.25	Blast, smut
		Mean					26.74	24.40	
	Somwarpet	Hebbale	12.20	75.96	Red laterite soil	BPT-5204	27.56	24.32	Blast, smut
		Kushalanagar	12.45	75.95	Red laterite soil	Hemavathi	23.52	20.23	Brown leaf spot
		Kodlipete	12.79	75.88	Red laterite soil	Tunga	25.54	23.65	Brown leaf spot, Grain discoloration
		Suntikoppa	12.45	75.82	Red laterite soil	BPT-5204	26.35	25.12	Blast, Grain discoloration
		Mean					25.74	23.33	
	Virajpet	Kunjalageri	12.25	75.73	Red laterite soil	Tunga	25.33	23.63	Brown leaf spot, smut
		Nangala	12.15	75.82	Red laterite soil	Jyothi	24.62	22.36	Blast, Grain

								discolouration
	Arameri	12.23	75.76	Red laterite soil	Sayadri kempu mukti	26.45	24.23	Blast, Smut
	Betoli	12.16	75.79	Red laterite soil	BPT-5204	27.45	25.65	Blast, Smut
	Mean					25.96	23.96	
	District Name					26.21	23.84	

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease incidence	Percent disease index	Other diseases observed
Shivamogga	Bhadravathi	Bandarhalli	13.84	74.68	Red soil	Jyothi	20.52	18.23	Blast, Brown leaf spot
		Donabaghatta	13.89	75.70	Red soil	IR-64	18.54	16.52	Blast, Smut, Sheath blight
		Malligenahalli	13.72	75.63	Red soil	MTU-1001	17.56	15.21	Blast, Brown leaf spot
		Sidleepura	13.95	75.68	Red soil	Burma	12.35	9.45	Brown leaf spot
		Mean					17.24	14.85	
	Sagara	Adarante	14.23	75.01	Red soil	JGL 24423	19.52	16.12	Blast, Smut, Brown leaf spot
		Chikkanelluru	14.28	75.04	Red soil	MTU-1001	16.88	14.52	Blast, Smut
		Kanle	14.16	75.03	Red soil	Supriya	17.25	15.36	Sheath Blight, Brown leaf spot
		Tagarti	13.97	75.82	Red soil	Jyothi	19.25	17.52	Smut, Blast
		Mean					18.22	15.88	
	Shivamogga	Ayanuru	13.93	74.99	Red laterite	BPT-5204	22.56	20.12	Brown leaf spot, Grain discolouration
		Haranahalli	13.26	75.60	Red soil	Sona	13.12	10.21	Blast, Brown leaf Spot
		Kunsi	14.08	75.37	Red soil	Jyothi	18.52	16.21	Smut, Brown leaf spot
		Purale	13.55	75.36	Red laterite	MTU-1001	17.52	14.21	Blast, Sheath Blight
		Mean					17.93	15.18	
		Agalabagilu	13.78	75.19	Clay loamy soil	Supriya	15.45	13.24	Smut, Sheath blight
		Alageri	13.65	75.21	Loamy soil	Jaya	19.23	16.52	Brown leaf spot, Smut
		Balehalli	13.51	75.15	Loamy soil	MTU-1001	20.23	17.52	Blast, Smut
		Dabbanagadde	13.41	75.14	Loamy soil	Jyothi	24.26	20.24	Sheath blight, Smut
		Mean					19.79	16.88	
	District Mean					18.30	15.70		

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease incidence	Percent disease index	Other diseases observed
Udupi	Bramhavar	Cherkady	13.42	74.82	Red laterite soil	MO-21	24.32	22.25	Blast, Smut
		Manoor	13.53	74.70	Red laterite soil	MO-4	27.13	25.23	Blast
		Pejamangoor	13.44	74.84	Red laterite soil	MO-21	23.21	21.46	Brown leaf spot, Grain discolouration
		Shiriyara	13.54	74.78	Red laterite soil	Jaya	22.13	18.56	Blast, Grain discolouration
		Mean					24.19	21.87	
	Karkala	Bola	13.14	74.90	Red laterite soil	Jaya	23.54	20.12	Blast, Smut
		Nitte	13.18	74.94	Red laterite soil	Sayadri kempu mukti	22.85	22.54	Blast
		Palli	13.24	74.87	Red laterite soil	Uma	22.56	20.32	Smut, Grain discoloration
		Sooda	13.21	74.86	Red laterite soil	MO-4	24.62	23.54	Brown leaf spot
		Mean					23.39	21.63	
	Kundapura	Aloor	13.74	74.70	Red laterite soil	Uma	21.45	18.23	Blast, Smut
		Bellal	13.71	74.82	Red laterite soil	Jyoyhi	24.31	22.54	Grain discolouration, Blast
		Kandavara	13.60	74.75	Red laterite soil	MO-21	24.56	24.23	Brown leaf Spot
		Tekkatte	13.55	74.70	Red laterite soil	Sayadri kempu mukti	24.65	22.34	Brown leaf spot
		Mean					23.74	21.83	
		District Mean					23.77	21.77	

Table 2: Survey for the incidence and index of sheath rot of rice in hilly and coastal zones of Karnataka during *Kharif* 2021-22

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease index	Percent disease incidence	Other diseases observed
Chikkamagaluru	Mudigere	Banakal	13.14	75.54	Red loamy soil	MTU-1001	20.22	22.41	Brown leaf spot
		Gonibeedu	13.09	75.71	Red loamy soil	IET Sanna batta	23.96	25.88	Brown leaf spot
		Kalasa	13.23	75.35	Red loamy soil	JGL-24423	23.12	25.62	Blast, Grain discolouration
		Kundururu	13.15	75.67	Red loamy soil	KHP-11	24.26	25.65	Blast
		Mean					22.89	24.89	
	Narasimharajapura	Bairapura	13.31	75.77	Red loamy soil	Sayadri kempu mukti	23.54	23.90	Blast, Smut
		Balehonnuru	13.34	75.46	Red loamy soil	Tunga	19.54	21.46	Blast
		Gubbiga	13.59	75.45	Mixed soil	KPR 1	22.35	25.45	Brown leaf spot
		Honnekodige	13.44	75.20	Red loamy soil	Hemavathi	16.54	19.29	Brown leaf spot, Grain discolouration
		Mean					20.49	22.52	
	Shringeri	Dharekoppa	13.45	75.22	Red loamy soil	Ratnachudi	16.21	18.52	Blast, Grain discolouration
		Honnavalli	13.33	75.28	Red loamy soil	Tunga	20.54	21.52	Brown leaf spot
		Melukoppa	13.46	75.24	Red loamy soil	Intan	25.21	26.32	Blast, Udabatta
		Shringeri	13.42	75.25	Mixed soil	Holesalu	16.52	19.65	Sheath blight, Smut
		Mean					19.62	21.50	
	District Mean					21.00	22.97		
	Dakshina Kannada	Mangaluru	Konaje	12.81	74.92	Alluvial soil	Intan	27.05	24.68
Mulki			13.08	74.09	Red laterite soil	MO-21	25.55	24.06	Brown leaf spot, Grain discolouration
Panja			12.67	75.47	Red loamy soil	Kajji Akki	24.56	22.52	Blast, Smut
Surathkal			12.99	74.80	Red laterite soil	Intan	24.52	22.35	Smut, Grain Discolouration
Mean							25.42	23.40	

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease index	Percent disease incidence	Other diseases observed
Dakshina Kannada	Puttur	Irde	12.68	75.19	Red laterite soil	MO-21	27.54	24.62	Blast
		Panaje	12.64	75.16	Red laterite soil	Jaya	24.85	22.32	Brown leaf spot
		Puttur	12.76	75.20	Red laterite soil	MO-4	28.96	25.45	Blast
		Sarve	12.72	75.28	Red loamy soil	Jaya	25.85	23.45	Blast, Smut
		Mean					26.80	23.96	
	Sullia	Bellare	12.66	75.36	Red loamy soil	Jaya	26.25	24.52	Blast
		Markanja	12.56	75.50	Red loamy soil	Sayadri kempu mukti	23.65	21.25	Smut, Grain discolouration
		Panja	12.67	75.47	Red laterite soil	Intan	28.65	27.52	Brown leaf spot
		Sulia	12.55	75.39	Red laterite soil	Tunga	21.45	20.36	Brown leaf spot, Smut
		Mean					25.00	23.41	
District Mean					25.74	23.59			
Hassan	Belur	Heggadde	12.88	75.72	Red soil	Karna	20.56	17.02	Sheath Blight, Grain discolouration
		Halebeedu	13.21	75.99	Red soil	Jaya	23.85	22.45	Blast, Smut
		Keraluru	13.04	75.91	Red soil	Sharavathi	18.53	16.25	Blast, Sheath Blight
		Madihalli	12.88	76.03	Red soil	Hemavathi	20.85	17.52	Smut, Grain discolouration
		Mean					20.94	18.31	
	Holenarasipura	Ankanahalli	12.88	76.22	Red soil	RNR-15048	15.02	13.45	Blast, Smut
		Dakshinanala	12.79	76.22	Red soil	IR-64	24.52	22.68	Blast
		Halekote	12.84	76.18	Red soil	IET-24451	25.85	23.56	Brown leaf spot, Grain discolouration
		Kattahalli	12.79	76.19	Red soil	Jaya	19.65	18.54	Sheath Blight, Smut
		Mean					21.26	19.55	Sheath Blight, Grain discolouration

Sakleshpura	Belagodu	12.97	75.87	Red soil	KHP 5	24.21	22.56	Brown leaf spot
	Hethur	12.79	75.78	Red soil	Mangala	20.25	18.45	Brown leaf spot
	Nadahalli	13.03	75.85	Red soil	RNR-15048	15.54	12.52	Grain discolouration, Smut
	Ramenahalli	13.38	75.34	Red soil	MTU-1001	21.54	19.54	Blast, Smut
	Mean					20.38	18.26	
District Mean					20.86	18.70		

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease incidence	Percent disease index	Other diseases observed
Kodagu	Madikeri	Balamuri	12.28	75.71	Red laterite soil	KPR-2	27.54	25.28	Blast, smut
		Hosakeri	12.35	75.81	Red laterite soil	BPT-5204	32.12	29.02	Blast
		Kothur	12.19	75.80	Red laterite soil	Hemavathi	25.02	22.85	Blast, Smut
		Madikere	12.42	75.73	Red laterite soil	Tunga	28.94	26.52	Brown leaf spot, Grain discolouration
		Mean					28.40	25.94	
	Ponnampet	AHRS Ponnmpet	12.14	75.93	Red laterite soil	BPT-5204	32.85	30.25	Brown leaf spot, Smut
		Balaji	12.17	75.95	Red laterite soil	KPR-2	27.64	25.92	Blast, smut
		Kunda	12.15	75.97	Red laterite soil	Tunga	26.58	24.35	Brown leaf spot, Grain discolouration
		Mattur	12.14	75.96	Red laterite soil	MTU-1001	28.95	26.52	Brown leaf spot
		Mean					29.00	26.76	
	Somwarpet	Gaddehosalli	12.54	75.98	Red laterite soil	Jyothi	26.54	24.95	Blast, Grain discolouration
		Hulase	12.51	75.96	Red laterite soil	Sayadri kempu mukti	28.58	26.50	Blast, Smut
		Kushalanagar	12.45	75.95	Red laterite soil	BPT-5204	30.54	27.95	Blast, Smut
		Mallenahalli	12.50	75.94	Red laterite soil	Tunga	25.33	23.63	Brown leaf spot, smut
		Mean					27.74	25.75	
	Virajpet	Betoli	12.16	75.79	Red laterite soil	Tunga	27.85	25.64	Brown leaf spot, Grain discolouration
		Kadanuru	12.21	75.76	Red laterite soil	Hemavathi	25.84	23.54	Brown leaf spot
		Maggula	12.20	75.81	Red laterite soil	BPT-5204	29.65	26.58	Blast, smut
		Nalkereri	12.04	76.01	Red laterite soil	BPT-5204	31.05	28.95	Blast, Grain discolouration
		Mean					28.59	26.17	
District Name					28.43	26.15			

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease incidence	Percent disease index	Other diseases observed
Shivamogga	Bhadravathi	Bhadravathi	13.82	75.70	Red soil	MTU-1001	18.62	16.54	Blast, Sheath Blight
		Bilaki	13.88	75.67	Red soil	Sona	14.56	12.54	Blast, Brown leaf Spot
		Holehonnur	13.98	75.69	Red soil	Jyothi	20.56	18.65	Smut, Brown leaf spot
		Tadasa	13.90	75.71	Red soil	BPT-5204	23.54	22.51	Brown leaf spot, Grain discolouration
		Mean					19.32	17.56	
	Sagara	Bilisiri	14.23	75.15	Red soil	MTU-1001	18.88	16.54	Blast, Smut
		Keladi	14.21	75.01	Red soil	JGL 24423	20.10	18.24	Blast, smut, brown leaf spot
		Malla	14.18	75.14	Red soil	Supriya	19.45	17.65	Sheath Blight, Brown leaf spot
		Maruru	14.16	75.07	Red soil	Jyothi	20.85	19.56	Smut, Blast
		Mean					19.82	18.00	
	Shivamogga	Agasavalli	13.90	75.51	Red soil	Sona	13.54	11.25	Brown leaf spot
		Gajanuru	13.93	75.54	Red laterite	Jyothi	20.54	19.25	Blast, smut, Sheath blight
		Purale	13.55	75.36	Red laterite	MTU-1001	18.36	17.54	Blast, Brown leaf spot
		Shivamogga	13.92	75.56	Red soil	BPT -5204	21.56	20.85	Blast, Brown leaf spot
		Mean					17.22	18.50	
	Thirthahalli	Araga	13.93	75.49	Clay loamy soil	MTU-1001	21.54	19.65	Blast, Smut
		Balehalli	13.51	75.15	Loamy soil	Jaya	22.51	19.54	Brown leaf spot, Smut
		Mulubagilu	13.66	75.18	Loamy soil	Supriya	15.85	14.52	Smut, Sheath blight
		Thirthahalli	13.68	75.24	Loamy soil	Jyothi	23.65	21.58	Sheath blight, Smut
		Mean					20.88	18.82	
District Mean					19.63	17.90			

District	Taluk	Village	Latitude (N)	Longitude (E)	Soil type	Genotypes	Percent disease incidence	Percent disease index	Other diseases observed
Udupi	Bramhavar	Havanje	13.39	74.80	Red laterite soil	MO-4	26.62	24.02	Brown leaf spot
		Hosur	13.34	74.74	Red laterite soil	Uma	22.45	20.85	Smut, Grain discoloration
		Kenjur	13.33	74.75	Red laterite soil	Sayadri kempu mukti	25.52	24.00	Blast
		Neelavara	13.44	74.81	Red laterite soil	Jaya	24.64	21.54	Blast, Smut
		Mean					24.80	22.60	
	Karkala	Kanthavara	13.14	74.96	Red laterite soil	Jaya	23.64	20.52	Blast, Grain discoloration
		Karkala	13.21	74.99	Red laterite soil	MO-4	28.20	26.64	Blast
		Nallur	13.19	74.06	Red laterite soil	MO-21	25.12	23.56	Blast, Smut
		Nitte	13.18	74.94	Red laterite soil	MO-21	24.45	23.00	Brown leaf spot, Grain discoloration
		Mean					25.35	23.43	
	Kundapura	Asodu	13.58	74.73	Red laterite soil	MO-21	27.54	26.54	Brown leaf Spot
		Korgi	13.56	74.76	Red laterite soil	Jyothi	26.85	24.52	Grain discoloration, Blast
		Kundapura	13.63	74.69	Red laterite soil	Uma	22.54	20.23	Blast, smut
		Molahalli	13.60	74.80	Red laterite soil	Sayadri kempu mukti	27.35	25.45	Brown leaf spot
		Mean					26.07	24.18	
		District mean					25.40	23.40	

During *Kharif* 2021-22, the percent disease incidence ranged from 14.56 to 32.85 percent whereas, percent disease index ranged from 12.54 to 30.25 percent (Table 2). Among the villages surveyed, the highest percent incidence and index (32.85 and 30.25%, respectively) of sheath rot was noticed in fields of AHRS, Ponnampet village in Kodagu district followed by Hosakeri village of Madikeri district (32.12 and 29.02%, respectively) whereas least percent incidence and index (13.54 and 11.25%, respectively) of the disease was recorded in Agasavalli village of Shivamogga district. The average disease incidence (28.43%) and index (26.15%) in Kodagu district and was in the range of 25.02 and 22.85 percent, respectively in Kothur to 32.85 and 30.25 percent, respectively in AHRS, Ponnampet, while in Shivamogga district the range was 13.54 and 11.25 percent respectively, in Agasavalli to 23.54 and 22.51 percent, respectively in Tadasa with average district disease incidence (19.63%) and index (17.90%).

Out of 20 taluks, the mean maximum disease incidence (29.00%) and index (26.76%) was noticed in Ponnampet taluk followed by Virajpet taluk (28.59 and 26.17%, respectively) of Kodagu district. Least mean percent disease incidence (18.50%) and disease index (17.22%) was noticed in case of Shivamogga taluk of Shivamogga district (Table 2). Among the different districts surveyed, the mean maximum percent disease incidence (28.43%) and index (26.15%) was noticed in Kodagu district, followed by Dakshina Kannada district (25.74 and 23.59%, respectively) whereas mean minimum percent disease incidence (19.63%) and index (17.90%) was observed in Shivamogga district.

Among all districts, the maximum disease incidence and index was recorded in Kodagu which may be due to susceptibility of cultivars, mono-cropping, closer spacing and favorable environmental conditions *viz.*, optimum temperature and relative humidity, moisture conditions that must have favored to build up of inoculum and subsequently showing increase in disease index, whereas in Shivamogga and Hassan districts the disease was recorded less compared to other areas. This may be due to unfavorable environmental

conditions which reduced the buildup of inoculums thus reduced the disease.

Results are in accordance with Shivaprakash (2015) [4] who conducted a survey and revealed that sheath rot incidence and index (39.09 and 24.71%) was more in Thirthahalli taluk and less prevalent (2.09 and 1.62%) in Shikaripura taluk of Shivamogga district. Similar findings was reported from Amritpal *et al.* (2022) [1] who conducted extensive roving surveys during *Kharif* seasons of 2019 and 2020 and found that in pooled data of both the years mean PDI ranged between 15.75-37.86 percent. The highest overall mean PDI of 34.53 percent was recorded in Jammu district and minimum *i.e.* 18.15 percent in the Samba district. Similar findings were reported from Manasa *et al.* (2022) [3] conducted roving survey during *Kharif* 2021 reported that sheath rot incidence in the surveyed fields ranged from 3.0 to 37.7 percent. The highest incidence (37.7%) was recorded in Nagarkurnool district, whereas the lowest incidence (3.0%) in Nalgonda district of Telangana state.

Conclusion

Conducting roving survey is very much important to know the extent of disease causing in a particular area. Survey gives detailed information regarding genotypes being used, cropping practices, disease management practices etc. In present study, survey conducted during two season *Kharif* 2020-21 and 2021-22 showed that disease is more prevalent in hilly and coastal zones of Karnataka may be due to varied climatic conditions mainly prevailing rainfall conditions in these region.

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