Rice

Rice is one of the stable food. Rice disease is directly affected the dietary of the billion people.

Rice disease-

- Rice is vulnerable to range of disease caused by fungi, bacteria, virus other pathogen

Common Rice Diseases and Their Impacts

- **Rice Blast Disease**: Caused by *Magnaporthe oryzae*, affecting leaves, stems, and grains, leading to significant yield losses.

- **Sheath Blight**: Fungal disease impacting leaves and sheaths, causing lesions, rot, and decreased grain quality and yield.

- **Bacterial Leaf Blight**: Causes water-soaked lesions and blighting, leading to reduced yield.

- **Brown Spot**: Affects leaves, panicles, and nodes, hindering grain development.

Note- if you see rice blast disease and brown spot disease, they looks same but difference are the

- **Rice blast disease**

Caused by the fungus Magnaporthe oryzae, this disease causes lesions that are oval-shaped with white or gray centers and dark green borders. As the disease progresses, the lesions can become spindle-shaped and the centers can turn whitish to gray with red to brownish or necrotic borders.

- **Brown spot disease**

Caused by the fungus Bipolaris oryzae, this disease causes lesions that are dark brown with thin centers and dark brown to purple margins. The lesions can merge to form irregularly shaped blotches.

-Grain discoloration

Grain discoloration is a disease that affects rice grains, causing them to lose quality and texture. It can cause the grains to be discolored in a variety of ways, including:

- **Appearance**

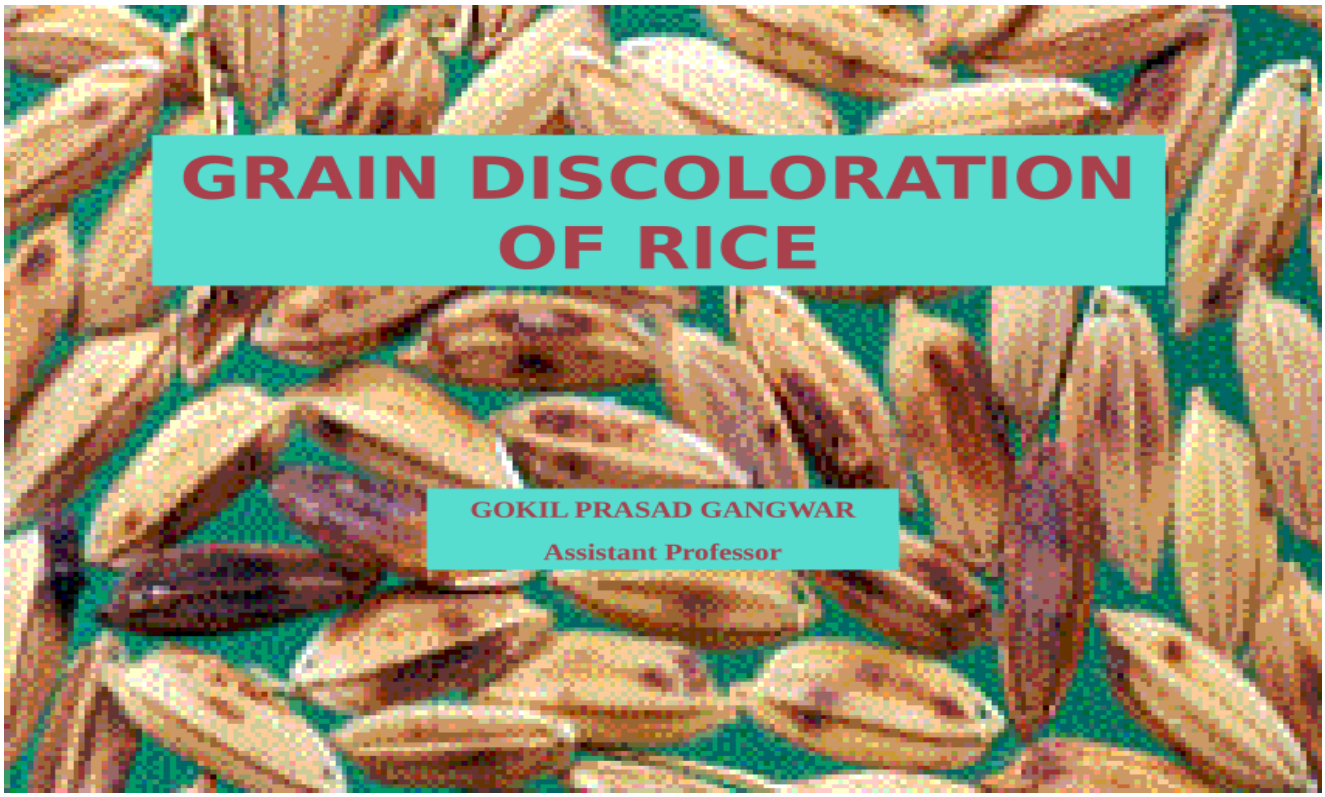
Grains may have dark brown or black spots, or be red, yellow, orange, or pink.

- **Location**

The discoloration can be internal, on the kernels, or external, on the glumes.

- **Severity**

The severity of the disease can vary depending on the season, locality, and climatic conditions



Key Rice Diseases in Karnataka

1. **Serious Threat**: Rice Blast, Sheath Blight, and Grain Discoloration have become major threats to rice crops in Karnataka.
2. **Study Period**: Disease patterns were studied during the Kharif seasons of 2012 and 2013.

Disease Incidence by Region

- **Leaf Blast**:
  - Highest incidence in Mandya district with an average of 37.20%.
  - Other high-incidence areas include Ramanagar (36.67% in 2012 and 36.54% in 2013).
- **Sheath Blight**:
  - Highest incidence in Yadgir district with an average of 41.76%.
  - Other high-incidence areas include Raichur (27.16% in 2012 and 30.59% in 2013).
- **Grain Discoloration**:
  - Highest incidence in Bellary district (33.82% in 2012 and 31.24% in 2013).
  - Other affected areas include Koppal (31.78% in 2012 and 27.16% in 2013).

Pathogen Involved

- **Curvularia lunata**: This fungus was identified as a dominant pathogen in discolored grains.

Table 2. District wise average incidence of grain discoloration, sheath blight and leaf blast diseases of paddy in Karnataka during *Kharif* 2012 and 2013

Rice growing ecosystem	District	Grain Discoloration				Sheath Blight		Leaf Blast	
		2012		2013		2012	2013	2012	2013
		PDI	PI	PDI	PI	PI	PI	PI	PI
Irrigated maidan area (North)	Yadgir	18.69	21.48	19.07	21.66	36.23	41.76	23.43	27.08
	Raichur	23.52	24.58	20.02	23.30	27.16	30.59	30.00	30.23
	Koppal	30.63	31.78	24.95	27.16	25.65	26.94	29.13	29.15
	Bellary	30.35	33.82	28.23	31.24	26.47	25.32	21.12	21.06
Southern transitional area	Davanagere	17.31	19.80	18.21	20.72	19.65	21.53	21.54	20.48
	Shimoga	19.25	21.39	19.99	22.92	21.68	20.13	23.14	21.08
Irrigated maidan area (South)	Hassan	15.44	19.39	14.83	17.65	15.45	15.66	20.31	20.26
	Mandya	17.13	20.05	16.92	19.28	19.26	18.84	37.20	36.91
	Mysore	16.61	19.51	15.73	18.71	25.17	27.07	36.22	34.95
	Ramanagar	20.15	22.25	18.95	21.17	23.07	27.79	36.67	36.54
	Chamarajnagar	17.75	21.09	17.78	19.57	19.27	20.32	34.74	35.16
Hilly area	Kodagu	18.13	20.25	17.20	19.73	14.09	15.90	21.40	20.56
	Chikamagalur	15.44	17.54	16.55	19.53	18.34	17.86	22.39	21.85
	Uttara Kannada	18.78	21.66	17.79	20.72	19.23	20.29	24.30	20.06
Coastal area	Dakshina Kannada	18.57	21.45	17.72	20.73	15.73	16.49	15.27	14.14
	Udupi	19.55	22.79	18.46	21.76	16.40	19.34	18.01	18.67

PDI= per cent disease index, PI= per cent disease incidence

Districts	Taluka	No. of villages	No. of fields	Grain discoloration				Sheath blight		Leaf blast	
				2012		2013		2012	2013	2012	2013
				PDI	PI	PDI	PI	PI	PI	PI	PI
Dakshina Kannada	Mangalore	05	15	18.24	21.28	17.22	20.26	16.63	17.51	14.64	14.59
	Bentval	05	15	18.90	21.61	18.21	21.19	14.83	15.46	15.89	13.68
	Mean			**18.57**	**21.45**	**17.72**	**20.73**	**15.73**	**16.49**	**15.27**	**14.14**
Udupi	Udupi	05	15	18.38	21.56	15.85	19.27	16.87	19.39	17.91	17.47
	Karkal	05	15	20.72	24.02	21.06	24.25	15.92	19.28	18.10	19.86
	Mean			**19.55**	**22.79**	**18.46**	**21.76**	**16.40**	**19.34**	**18.01**	**18.67**

PDI= per cent disease index, PI= per cent disease incidence

Per cent disease index (PDI) was calculated by using the below mentioned formula given by Wheeler (1969).

$$PDI = \frac{\text{Sum of all the disease ratings}}{\text{Total number of leaves examined}} \times \frac{100}{\text{Max. Disease grade}}$$

Per cent incidence was calculated by using the formula,

$$= \frac{\text{No. of infected plants}}{\text{Total no. of plants observed}} \times 100$$