

## Rice brown leaf spot (427)

### Common Name

Rice brown leaf spot. It is also known as glume blotch.

### Scientific Name

*Cochliobolus miyabeanus*. It is also known by its asexual name, *Bipolaris oryzae*.

### Distribution

Asia, Africa, North, South and Central America, the Caribbean, Europe, Oceania. It is recorded from Australia, Fiji, French Polynesia, New Caledonia, Papua New Guinea, and Solomon Islands.

### Hosts

Rice and wild grasses.

### Symptoms & Life Cycle

A fungus causes rice brown leaf spot disease. It is a common disease of seedlings, and on leaves, leaf sheaths, panicles, including the glumes and seeds, of developing and mature plants. The disease is worse in dryland compared to wetland cultivation, especially under continuous cropping and other situations where fertility is low. Low levels of NPK, and perhaps silica and manganese, are said to be associated with the disease.

Seedlings show small, circular, yellow-brown or brown spots girdling and distorting the leaf sheaths. Later, at tillering, circular to oval spots, up to 10 mm long, dark brown to purple, appear on the leaves (Photos 1&2). When mature, they have light brown to grey centres, surrounded by dark brown margins (Photos 2&3). On the seeds, the 'eye-spot' symptom (brown with light centres) is more pronounced (Photo 4). Infected seeds do not fill properly. Black spore masses develop on the spots of both leaves and seeds.

The disease is most severe when humidity is high, over 85%, for a few days with light rains, heavy dews, and temperature between 20-30°C.

Spread occurs over short distances as spores in the wind. Infected seed allows spread over longer distances. Survival occurs in infected seed, on volunteer rice, rice debris, and wild grasses.

### Impact

It is not considered a serious disease, especially when compared to rice blast (**see Fact Sheet no. 252**). However, IRRRI calculates that losses of 5% yield from this fungus occur throughout South and Southeast Asia annually, with local losses exceeding 40%. The losses are caused by a combination of seedling death and loss in quality and weight from seed infections. There appears to be a correlation between impact and soil nutrient deficiency.

### Detection & inspection

The spots are similar to rice blast (**see Fact Sheet no. 242**), but differ: (i) they usually appear later, and (ii) the spots are more regular in outline and have lighter centres. Look for the large brown lesions, up to 2.5 cm long, on the stems under the leaf sheaths, when stripped away.



Photo 1. Early infection of rice by brown leaf spot, *Cochliobolus miyabeanus*.



Photo 2. Infection of rice by brown leaf spot, *Cochliobolus miyabeanus*.



Photo 3. Late infection of rice by brown leaf spot, *Cochliobolus miyabeanus*, showing light grey centres and brown margins.



Photo 4. Eye-spot symptoms on rice grains caused by the brown leaf spot fungus, *Cochliobolus miyabeanus*.

## Management

### CULTURAL CONTROL

Before planting:

- Treat seed with hot water: 53-54°C for 10-12 minutes.

During growth:

- Ensure that plants have correct nutrition: apply fertilizer at recommended rates.

After harvest:

- Collect straw and other debris after harvest and burn it with the stubble, or plough everything into the soil.

### RESISTANT VARIETIES

Use resistant varieties. Check with local agriculture extension staff for those that are appropriate in your region.

### CHEMICAL CONTROL

Chemical control should only be considered after investigating the possibility of nutritional deficiencies and the availability of resistant varieties. IRRRI recommends seed treatments with iprodione, strobilburins (azoxystrobin or trifloxystrobin), azole (propiconazole), or carbendazim fungicides. Foliar treatments at tillering and at late boot stage (extension of flag leaf) have also been recommended but are effective only if combined with a seed treatment.

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*When using a pesticide, always wear protective clothing and follow the instructions on the product label, such as dosage, timing of application, and pre-harvest interval. Recommendations will vary with the crop and system of cultivation. Expert advice on the most appropriate pesticide to use should always be sought from local agricultural authorities.*

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Information from Sparks A (undated) Brown spot. Rice Knowledge Bank. IRRRI. (<http://www.knowledgebank.iri.org/training/fact-sheets/pest-management/diseases/item/brown-spot>); and *Cochliobolus miyabeanus*. Wikipedia ([https://en.wikipedia.org/wiki/Cochliobolus\\_miyabeanus](https://en.wikipedia.org/wiki/Cochliobolus_miyabeanus)); and CABI (2018) *Cochliobolus miyabeanus* (brown leaf spot of rice). Crop Protection Compendium. (<https://www.cabi.org/cpc/datasheet/14691>); and from Graham KM (1971) *Plant diseases of Fiji*. Her Majesty's Stationery Office. London. Photo 1 Yuan-Min Shen, Taichung District Agricultural Research and Extension Station, Bugwood.org. Photos 2-4 Donald Groth, Louisiana State University AgCenter, Bugwood.org

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