

Technical Bulletin #55:

## Brown Spot

### Cause and distribution

Brown spot is a fungal disease that is present in all of the main rice-growing areas in the world. In Cambodia, it affects mainly rain fed and upland rice production areas.



Different types of brown spot lesions on the leaf of a mature rice plant.



Brown spot lesions on a rice crop. The leaf on the left is showing the first symptoms. On the right, the lesions are completely developed.

### Importance of the disease and symptoms

Brown spot is a major rice disease and mainly occurs in areas which:

1. are suffering from drought conditions
2. experiencing deficiency in nitrogen, phosphorus, and potassium
3. have poorly drained soils
4. are badly managed

Brown spot affects the rice plant at all crop development stages, but the typical brown spot symptoms at tillering stage are manifested by small and circular foliar lesions that are initially dark brown to purple-brown. These lesions are circular to oval with a light brown to gray center and reddish brown margin (see pictures).



Lesions on leaf sheaths look similar to those on the leaves. Infected glumes and panicle branches have dark brown to black oval spots or discoloration on the entire surface. Spike-lets can also be infected. Infection of florets leads to incomplete or disrupted grain filling and a reduction in grain quality.

Infected seeds have black or brown spots on glumes.

### **Yield losses**

Brown spot causes both quantitative and qualitative losses. It is estimated that brown spot can cause up to 50% yield losses in extreme cases.

### **Management**

The pathogen is able to survive on infected rice straw, stubbles, weeds, and seeds, and cause brown spot on the resulting crop.

Unregulated seed exchange and poor seed quality and hygiene can cause the spread of the disease within farms and villages.

Brown spot is usually found in fields where farmers cannot afford to buy inputs like fertilizers. Plants growing on sandy and infertile soils are also susceptible to brown spot.

It can also occur in irrigated fields that are poorly drained and have excessive organic matter. Brown spot development is also helped by reduced water supply, particularly when the rice crop is direct-seeded.

When the crop has been affected heavily by brown spot in the past year, new seed should be used for sowing.

Improving the overall soil fertility through application of sufficient organic matter and chemical fertilizers will decrease the occurrence of brown spot.

Fungicides such as Carbendazim can be used to control brown spot in the field in extreme cases, but mostly no treatment is necessary. Seed treatments with fungicides or with hot water (10 minutes at 50°C) are also useful management options before sowing. Please contact a Cambodia HARVEST technician if you want to use fungicides.

For fields that are heavily affected by brown spot, the farmer should be careful to remove or burn all rice straw and stubbles and remove weeds in surrounding fields and bunds as much as possible.

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