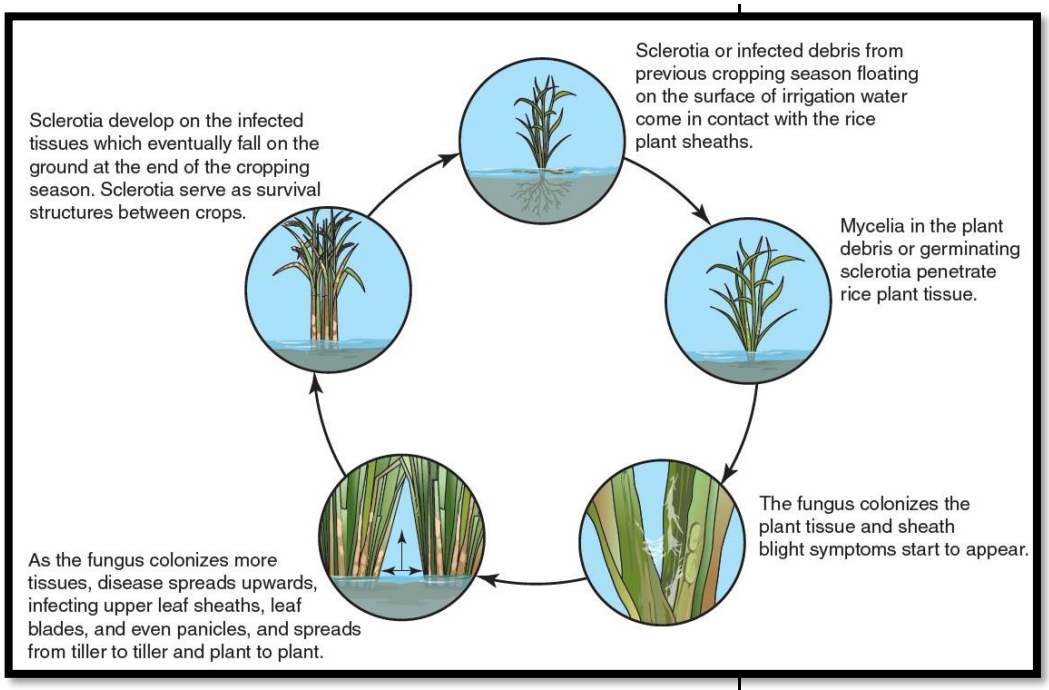
Rice Sheath Blight Disease: A Threat to Rice Crop

Sapna[1] and Saurabh Dubey[2]
[1]Deparatment of Plant Pathology, GBPUAT, Pantnagar, Uttarakhand, 263145
[2] Subject Matter Specialist, Plant Protection, KVK, Madhopur, West Champaran, Bihar, 845454
*Corresponding Author: sapnagbpuat@gmail.com

Diseases are the major factors for reduction in crop yield of rice, according to Margani and widadi (2018). There are number of pathogens cause loss in rice crop among them rice sheath blight (*Rhizoctonia solani*) disease is major concern and it causes considerable yield losses Prasad and Kumar (2011). Rice sheath blight can lead to significant yield losses if not properly managed. Severe infections can cause lodging, reduce grain quality, and result in economic losses for farmers. According to Jha *et al*. (2012) rice sheath blight is economically most important disease and causes about 25-30% yield losses per year in India. It is caused by the fungus *Rhizoctonia solani* particularly the anastomosis group AG1-IA. Rice sheath blight is a significant concern for rice farmers around the world, particularly in regions with warm and humid climates. This brief article aims to provide an understanding of the disease, its symptoms, disease cycle, impact, epidemiology, and management strategies.

Symptoms:

- The most noticeable symptoms of rice sheath blight appear during the later stages of rice growth.
- The symptoms include the development of elliptical or irregularly shaped lesions on leaf sheaths near water level, stems, and panicles of rice plants.
- The lesions on plant start as small water-soaked spots and then expand, becoming whitish-gray and surrounded by a dark brown border.
- The presence of several large lesions on a leaf sheath usually causes death of the whole leaf, and in severe cases all the leaves of a plant may be blighted in this way.
- The fungus can spread into the culms from early sheath infections and weaken the infected culms, resulting in the lodging and collapse of tillers.
- The infection extends to the inner sheaths resulting in death of the entire plant.
- Plants heavily infected in the early heading and grain filling growth stages produce poorly filled grain, especially in the lower part of the panicle.



Disease Cycle

- Rice sheath blight is soil borne disease but the pathogen also survives in crop residues and on infected plant material.
- It can infect rice plants at any growth stage but it is most common on early heading and grain filling growth stages.
- The fungus spreads through spore-producing structures called sclerotia, which can be moved by wind, water, and machinery.

Environmental Factors

- Warm and humid conditions are favourable for the development and spread of rice sheath blight.
- Relative humidity from 96 to 100% and temperature from 28-32 °C favours the disease development.
- Heavy rainfall, extended periods of leaf wetness, and high humidity can create ideal conditions for the disease to thrive.

Management

An integrated management approach, consisting of resistant or moderately resistant varieties, sound cultural practices, and foliar fungicide application is ideal for effective and economic control of sheath blight and associated yield losses. Varietal susceptibility, field disease history, timely scouting for the presence of the disease, and local weather conditions that favor the disease, are among the critical factors to be considered for making effective disease management decisions. Sheath blight develops at a rapid pace under favorable conditions. The disease should be monitored on a regular basis starting from the panicle differentiation stage until heading. Infection after heading may cause insignificant economic losses due to sheath blight. There are following points recommend for management of rice sheath blight.

- Avoid planting of rice continuously in the same field to reduce the buildup of the pathogen in the soil.
- Planting rice varieties that exhibit resistance to sheath blight can be an effective strategy.
- High seeding rate and overuse of nitrogen fertilizer usually increase stand and induce excessive vegetative growth and canopy density, creating a moist microclimate favourable for disease development. Therefore, avoiding high seeding rates and excessive application of fertilizers, especially nitrogen, can reduce the damage caused by sheath blight.
- Avoiding excessive water application can help to reduce humidity and minimize disease development.
- Combined application of *T. viride* at 5.0 kg and Validamycin at 2.0 l/ha showed effective management tactic (Daroga Singh *et al*., 2007).
- Seed treatment with *Pseudomonas fluorescens* + *Trichoderma viride* @ of 10g/kg of seed followed by seedling dip @ of 2.5 kg or products/ha

dissolved in 100 litres and dipping for 30 minutes.

- Soil application of P. fluorescens + *Trichoderma viride* @ of 2.5 kg/ha after 30 days of transplanting.
- The disease is soil borne hence application of FYM 12.5 t/ha or green manure 6.25 t/ha to promote antagonistic microflora in the soil.
- Practices such as balanced fertilization, proper plant spacing, and avoiding excessive irrigation can help reduce disease pressure.
- Avoid flow of irrigation water from infected fields to healthy fields.
- Spray of Propiconazole 13.9% + Difenoconazole 13.9% EC @ 1ml /liter of water.
- Spray of Thifluzamide 24 SC @ 1ml /liter of water (45 days after transplanting)

Conclusion

In summary, sheath blight is a significant threat to rice cultivation, causing substantial economic losses and reducing food security in affected regions. Thus, the disease is a critical challenge for rice growers globally, impacting yield, grain quality, and economic returns. Ongoing research efforts are crucial for developing sustainable management strategies, including resistant varieties and environmentally friendly approaches, to mitigate the threat of sheath blight and ensure food security in rice-dependent regions.

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