

Rice Blast Management Methods

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Blast, caused by the fungus *Pyricularia oryzae*, is the most important rice disease in the world. In the United States, it is only second to sheath blight in importance due to its erratic occurrence. If you compare sheath blight to blast in damage potential, sheath blight would only reduce yields 25% in a field under the worst situation while blast is capable of completely destroying the crop. Blast is one of the most explosive and damaging diseases and must be managed aggressively. Yield losses as high as 90% have been reported in commercial fields. Management of blast is based on a combination of host resistance, cultural management, and fungicide application. These management practices are not effective unless the grower knows the basic pathogen biological information and has an understanding of how the disease develops. Biological, epidemiological, environmental, and cultural information will be presented on rice blast. Water management, field selection, fertilization, and fungicide timing are critical for control. This information will be combined to develop an effective blast management system.

Blast can be found on the rice plant from the seedling stage until maturity. In the United States blast appears at two primary times, during tillering and heading growth stages. The leaf blast stage occurs primarily from the seedling stage to just past tillering, peaking at mid-tillering. The rotten neck phase appears as the panicle is emerging until maturity. Blast has several names based on the plant part it is infecting. These include leaf blast, neck blast or rotten neck blast, depending if the head breaks over or off, panicle blast when the panicle branches are infected, or node blast when the culm nodes are infected.

Blast is favored by long dew periods, high relative humidity, light winds, and warm days and cool nights. Other factors that favor blast are excessive N levels, late planting, sandy light soils, tree-lined fields, and a high percentage of susceptible varieties being grown in the area. **However, the most favorable agronomic practice that favors blast is the loss of flood.** Blast is several times more severe under upland conditions than when flooded. If the flood must be removed for insect control, herbicide damage, straighthead control, or some other reason, reestablish the flood as soon as possible and scout regularly for blast.

The fungus is spread by windborne spores that can spread long distances. The fungus infects the tissue, a lesion is formed and spores are produced that cause more infections in as little as 7-10 days. Blast is one of the most explosive plant diseases in the world and acts like a bio-herbicide killing plants to the ground. Blast tends to be more severe in later planted rice because spore pressure is higher later in the season due to spores from earlier rice.

Resistant varieties are available. This resistance comes in two forms, single gene and multi-genic. They are also called race specific and horizontal resistance since the single gene resistance normally protects against one or a few races of the fungus while the horizontal or field resistance protects against most or all races of the fungus. Single gene resistance tends to be effective for shorter periods of time until the fungus can adapt to or overcome it while field resistance tends to be more stable over longer periods of time. However, almost every resistant variety will become susceptible over time as the fungus adapts to the variety.

Scouting for blast should begin early in the season starting at tillering and continuing through heading. Leaf blast usually appears in high areas of the field where the flood is shallow or has been lost. Areas of heavy N fertilization and edges of the field are also potential sites. If leaf blast is found in the field or has been reported in the area on that variety, a fungicide application is advisable. The fungicide is not applied at the vegetative stages of the rice unless stands are being lost to the disease. The most important management practice at this stage is to reestablish or increase the flood to ensure all of the soil is covered with water (2-4 inches). Avoid applying too much additional N if top-dressing is necessary. Remember that correct disease identification is critical since several other diseases and crop damages mimic leaf blast. Most of these other symptoms do not warrant fungicide application.

Fungicide timing is critical for blast control. If a single application is being used, the best timing is when 50-70% of the heads emerging (Heading) but not 100% completely emerged (Headed). Application before or after this stage will not provide good control. As a rule of thumb, you lose 100 lb/A/day the fungicide application is delayed. If disease pressure is high, when the plants have a large number of leaf blast lesions on them, two fungicide applications may be necessary to obtain effective control. The first application should be applied between mid-boot and very early heading to protect early emerging heads and reduce spore numbers, and the second between 50-90% heading to protect the majority of the heads. If rotten neck or panicle symptoms have already appeared, fungicides will have little if any activity against this disease.

Rules of blast control:

- 1.Plant resistant varieties
- 2.Maintain the flood
- 3.Manage the crop to reduce blast pressure, including planting early, use optimum not excessive N, plant in heavier soils if possible
- 4.Avoid planting more susceptible varieties in sandy soils
- 5.Apply fungicide in a timely manner. Δ

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