Rice blast (Magnaporthe oryzae)

Causal agent: Fungus

Favourable conditions for disease development
- The disease occurs under long periods of free moisture which leads to continuous leaf wetness (>10 hours) and a high relative humidity (RH>90%). The optimum temperature range for infection is 25-28°C.
- Under favorable conditions, the infection process starts when fungal spores land on the leaf surface. The fungus penetrates into plant cells and multiplies by drawing nutrients from the plant.
- After about a week, the fungus has fully colonized the plant cells and produces aerial spores to enable it initiate a new cycle of infection. The spores are spread by water or wind splashes to the neighbouring plants and starts a new cycle of infection.
- The fungus remain in rice straw and stubble becomes source of inoculum in the subsequent seasons.
- Disease occurrence is also favoured by high planting density and poor drainage in paddy rice.
- Excessive use of nitrogenous fertilisers increases the plants susceptibility to the disease.

Geographical Distribution
- In all the rice growing regions in East Africa.

Crop losses and associated damage
- Yield losses of 70-100% have been reported under epidemic conditions.
- Symptoms differ based on the infected plant infected as follows:
  
  **Leaf blast:** Diamond or spindle-shaped lesions with gray centers surrounded by a red or brown margin. Lesions may enlarge and coalesce.
  
  **Neck blast:** Black or brown rot on the neck of the panicle. The panicles above are unfilled and turn white.
  
  **Node blast:** Black-brown lesions on the node. This causes the culm to break leading to death of the plant.
  
  **Collar blast:** Brown rot at the junction of the leaf blade and sheath.
  
  **Panicle blast:** The panicle turn brown-white.

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Factsheets for Rice Production, East Africa
Rice blast (*Magnaporthe oryzae*)

### Management Strategies

#### 1. Cultural Control methods

- Plant certified seeds.
- Avoid excessive use of nitrogenous fertilisers. Use fertiliser at recommended rates:
  - Basal (NPK 17:17:17, 125 kg/ha)
  - Tillering (AS, 100 kg/ha)
  - Panicle initiation (AS, 100 kg/ha)
- Improve content of silicon in the soil by application of silicon at a rate of 1000 Si Kg/ha. Silicon strengthens the plant cell wall which is a natural barrier that protects plants from attack by disease causing agents.
- Ensure there is optimal application of water. Water stressed rice plants are more susceptible to rice blast infection.
- Intercrop rice blast susceptible varieties with tolerant varieties to reduce disease pressure.
- Practice crop rotation with non-host crops to break the disease cycle.
- Plant early to avoid late season high disease pressure.
- Plant each variety at recommended spacing to avoid dense crop canopy. *(Refer to agronomic practices factsheet).*

#### 2. Resistant cultivars

- Use tolerant varieties such as NERICAs (1, 4, 10 & 11), BW 196, IR 2793-80-1.

#### 3. Biological control

- If available, use antagonistic biocontrol agents such as *Trichoderma* spp (such as Trianum P®, Rootgard®), *Pseudomonas flourescens* (such as Brochure B 1.75 WP®) for seed dressing.

#### 4. Chemical control

- Spray at maximum tillering and at panicle initiation using Carbendazim (such as Chariot 500 SC® at a rate of 100mls/20l), Prodione (such as Megaprode Lock 52.5® at a rate of 15mls/20l), Trifloxystrobin and Tebuconazole (such as Nativo®) at a rate of 5-10ml/20l.
- When using chemicals wear protective clothing and avoid contaminating the environment. Follow the manufacturers instructions on the label and ensure pre-harvest interval is observed.