Department of Primary Industries
Department of Regional NSW

DPI Primefact

Rice blast

Feb 2024, Primefact 1211, Fourth edition
Plant Biosecurity & Product Integrity

ALERT

The fungal disease rice blast was detected in rice crops in the northern rivers district on 10 February 2024. This represents a southern expansion of the geographic range of rice blast disease in Australia which has been known to impact rice crops in the northern states for more than a decade. Rice blast spores can travel long distances on monsoonal weather systems. Alternative hosts of the rice blast fungus include but are not limited to *Echinochloa crus-galli* (cockspur grass), *Eleusine coracana* (finger millet), *Eragrostris curvula* (African lovegrass), *Lolium spp.* (ryegrass), *Phalaris* spp. and *Setaria* spp., all of which occur in NSW.

Background

Rice blast is considered the most important disease of rice worldwide.

Rice blast is present in the northern states of Australia. In 2011 Rice Blast was found on a rice crop in northern Western Australia and is also found in the Northern Territory and Queensland on cultivated and wild rice.

Rice blast is a fungal disease caused by *Pyricularia oryzae* (also called *Magnaporthe oryzae*).

The Rice blast pathogen has never been detected in the New South Wales Rice Biosecurity Zone (see below). This disease is a threat to much of Australia's rice industry.

Hosts

Rice (*Oryza sativa*) is the main host of rice blast, although the fungus can live on many grass and cereal species including native rices. There are historical detections of the rice blast fungus on grassy species in NSW, but not in the Rice Biosecurity Zone, and this information been noted previously in DPI extension material.

Disease cycle

The rice blast pathogen overwinters as fungal strands or spores on diseased rice stubble, on infected seed or on living plants, such as grass weeds that grow over winter.

Infection in a new season may originate from the fungus overwintering on rice straw or may come from diseased grass weed species within or around the crop.

Rice blast spores are transported by wind and water often over long distances and can infect rice plants after landing on them. Many infection cycles may occur within a cropping season if weather conditions are favourable. Warm temperatures (around 22°C) and high humidity (>90% RH) at night favour infection.

Symptoms

Rice blast spores can infect plants at all growth stages, from seedlings to maturity. Symptoms develop on all above ground plant parts.

Lesions or spots are the most common symptom. Lesions are usually 1-1.5 cm long and 0.3-0.5 cm wide.

Crops under stress may exacerbate symptom development leading to rapid crop decline especially in susceptible varieties.

Leaf blast

Leaf lesions start as small white, grey or blue-tinged spot. Under moist conditions lesions enlarge quickly to either oval or diamond-shaped spots or to linear lesions with pointed ends, grey or white centres and narrow brown borders (Figure 1).

Severe infections may lead to death of leaves and whole plants. Leaf blast infections provide inoculum for panicles to become infected.

Figure 1. Rice blast lesions on leaves

[All images here courtesy of Donald Groth, Louisiana State University AgCenter, Bugwood.org]

Collar rot

If a rice blast lesion is located at the junction of the leaf blade and leaf sheath the entire leaf can be killed. The leaf collar lesion discolours to brown and the leaf blade dies (Figure 2).

Figure 2. Collar rot symptoms of rice blast

Node infection

Infected nodes appear black-brown and dry (Figure 3). An infection at the node often results in the stem breaking.

Figure 3. Node infection symptoms of rice blast

Neck rot

Neck rot may result in death of an entire panicle (Figure 4). Symptoms appear at the base of the panicle, starting at the node. The tissue turns brown and shrivels causing the stem to snap and lodge.

Figure 4. Neck rot symptoms of rice blast

Panicle blast

Panicles which do not break or fall off as a result of neck rot may turn white to grey. Partially infected panicles may show grey-brown lesions among the panicle branches and on the stems of florets. Florets which do not fill turn grey (Figure 5).

Figure 5. Panicle blast symptoms of rice blast

Farm Hygiene is key

Put in place biosecurity best practice actions to prevent entry, establishment and spread of pests and disease:

- practice “Come clean, Go clean”
- ensure all staff and visitors are instructed in and adhere to your farm biosecurity plan
- source high health seed
- keep records
- minimise interaction with infected crops and use good vehicle/equipment hygiene if infection is present
- adhere to the restrictions in place for the Rice Biosecurity Zone in the Riverina, NSW (see below for further details).

How is rice blast spread?

Rice blast is spread via windborne spores, on infected plant material and grain and in water. Spores can also be transmitted on clothing and machinery if you are working in an infected crop. Under dry conditions spores can survive for more than a year so transport of contaminated seed, souvenirs made of rice straw or contaminated equipment could introduce the disease into key production areas.

Management options

Regular monitoring is key to the management of rice blast. Given the potential for long distance natural spread of blast spores, **all rice growers in Australia should maintain vigilance for rice blast regardless of their location**.

Best practice guidelines for minimising the risk posed by rice blast include:

- Where available, plant resistant varieties
- Regularly monitor the crop for signs of blast
- Have the symptoms confirmed by a plant pathologist

- Control grassy weeds in and around cropping areas even when rice is not being grown
- Reduce stubble and crop residues following harvest and rotate with non-host crops
- Foliar application of fungicide such as Azoxystrobin (see APVMA permit PER94571) will reduce the impact of the disease but will not eliminate all spores in crop residue and soil.
- Prevent infected grain entering into the mainstream supply chain as equipment, processing machinery and transport vehicles can become contaminated with spores.

Equipment and vehicle decontamination

- Boots, equipment and vehicles should be thoroughly cleaned down with a pressure washer to remove mud and plant material then decontaminated if they have been in contact with an infected crop or grain.
- Boots and equipment can be decontaminated using a 2% bleach solution although, as this is corrosive, metal equipment will need to be rinsed with water afterwards.

Rice Biosecurity Zone

The Rice Biosecurity Zone (Figure 6) exists over key rice production areas in the Riverina/MIA, NSW. Compliance with zone requirements will help lessen the chance of blast reaching this area.

Restrictions in the Rice Biosecurity Zone include:

- do not move paddy rice or rice plants into the zone
- do not move any equipment used in rice production elsewhere in Australia into the zone
- do not move any coverings or containers that have been in contact with rice plants or rice production into the zone

Details on the Rice Biosecurity Zone (including maps) are listed in the Biosecurity Regulation 2017.

Any suspect detections of rice blast in the Rice Biosecurity Zone must be reported within 1 working day via:

- Exotic Plant Pest Hotline 1800 084 881
- Email biosecurity@dpi.nsw.gov.au with a clear photo and your contact details
- Complete an online form (https://forms.bfs.dpi.nsw.gov.au/forms/9247)

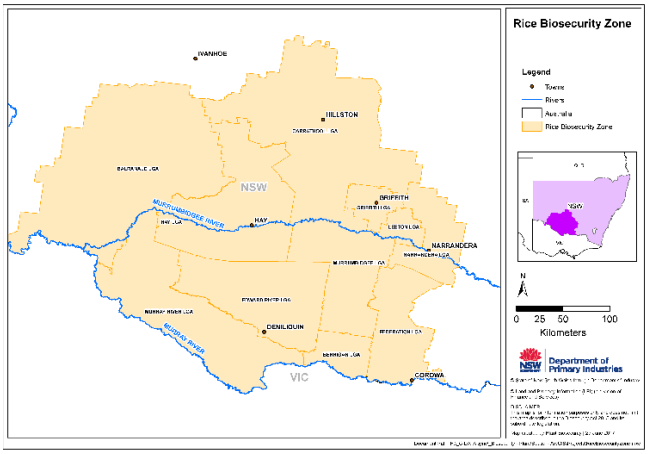

Figure 6: NSW Rice Biosecurity Zone