

Jackfruit Rhizopus rot (324)

Common Name

Jackfruit Rhizopus fruit rot

Scientific Name

Rhizopus stolonifer, previous names are *Mucor stolonifer*, *Rhizopus artocarpi*, *Rhizopus nigricans*.

Distribution

Worldwide. It is reported from Cook Islands, Fiji, French Polynesia, Niue, Samoa, and Solomon Islands

Hosts

Jackfruit, and many other plants are hosts. The fungus is common in the soil on plant debris, and also on many fruits (peach, strawberry) and vegetables after harvest, during transport and in storage. In the Pacific islands, *Rhizopus* has been recorded on sweet potato, breadfruit, passionfruit, citrus (mandarin and tangerine), and eggplant.

Symptoms & Life Cycle

Rhizopus rot is a common disease of jackfruit flowers and young fruit. It causes a soft, watery, brown spot on the fruit (Photo 1) that soon becomes covered in a grey-brown, later black, furry mould (Photos 3&4). Fruit symptoms occur on the tree and in storage.

On jackfruit, it is a primary pathogen, affecting the fruits at all stages of development whereas, on most other fruits and vegetables, *Rhizopus* infects through wounds caused by insects and weather events, or through cracks caused by abnormal growth. Infections also occur at the stem end of fruits when they are harvested.

In the field, warm, rainy days favour the disease, and in storage high temperature and humidity.

Spread is by large number of spores in the air. Survival occurs as thick-walled spores (black spore masses on top of long stalks (Photo 4), in the soil, on plant debris, and on seed. The spores can withstand long periods of drying and cold. Seed infection occurs after damage by insects or rots of the seed head, or fruit.

Impact

Probably a minor disease of little economic impact on jackfruit. However, total loss of fruit and vegetables can occur if there are long periods of warm, rainy weather. In storage, damage is likely if hygiene is poor, and temperature and humidity are high.

Detection & inspection

Look for the soft, rapidly development fruit rots on the tree or in storage. Look for the grey fungal growth, turning black as the spores develop.



Photo 1. Rots developing on a young jackfruit fruit caused by *Rhizopus stolonifer*.



Photo 2. Spores forming on a young jackfruit fruit infected by *Rhizopus stolonifer*.



Photo 3. Late-stage infection of jackfruit fruit by *Rhizopus stolonifer*, showing the groups of spores (sporangia) on long stalks (sporangiophores).



Photo 4. Black spore masses on top of long stalks (sporangiophores) of *Rhizopus stolonifer*.

Management

In most instances, management will not be required as the impact of the disease is low. If environmental conditions are such that they favour the disease, do the following:

CULTURAL CONTROL

During growth:

- Prune the trees so that air travels freely through the canopy and the fruit dries rapidly after rains.
- Carry out hygiene measures: remove infected fruits of all ages from the trees and any that have fallen to the ground.

After harvest:

- Harvest fruit with care, avoiding bruising it or creating wounds. Similarly, transport the fruit with care.
- Avoid storing fruit in warm, poorly ventilated, buildings with high humidity; if possible, store the fruit below 10°C. *Rhizopus* does not produce spores at 4°C. Remember, one fruit in a consignment can cause the rot of many others in a few days.
- Make sure the packing shed and boxes/bins are clean, removing any plant material on which *Rhizopus* could produce spores.

CHEMICAL CONTROL

If fungicides are required, apply a protectant product, e.g., mancozeb, or a systemic benzimidazole, e.g., thiophanate-methyl or a triazole, e.g., propiconazole. If a systemic product is used, alternate these with sprays of mancozeb. If the concern is only to protect the fruit in storage, spray once 10 days before harvest.

When using a pesticide, always wear protective clothing and follow the instructions on the product label, such as dosage, timing of application, and pre-harvest interval. Recommendations will vary with the crop and system of cultivation. Expert advice on the most appropriate herbicides to use should always be sought from local agricultural authorities.

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Information from Soft rot of Jackfruit (undated) Plantwise Knowledge Bank (<https://www.plantwise.org/KnowledgeBank/factsheetforfarmers/20157800446>); and Trakunsukharat P, et al. (2011) Rhizopus rot (Rhizopus stolonifer): PaDIL - <http://www.padil.gov.au>; and from (including Photos 1,2&4) McKenzie E (2013) (Rhizopus stolonifer): PaDIL - (<http://www.padil.gov.au>). Photo 3 Ellen Iramu, Honiara, Solomon Islands.

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