

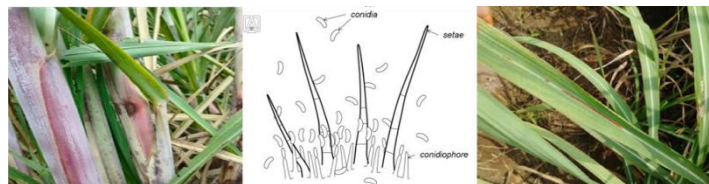
## Red Rot Disease: The fungus *Colletotrichum falcatum* causes in Sugarcane

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Red rot disease, which is caused by the fungal pathogen *Colletotrichum falcatum*, is one of the most devastating diseases that impact sugarcane cultivation. Initially reported in Java (Indonesia) in 1893, the disease was subsequently reported in India in 1901, mainly in Andhra Pradesh.



### Pathogen Description

*Colletotrichum falcatum* belongs to the phylum Ascomycota and the family Glomerellaceae. This pathogen is extremely pathogenic, and the main cause of massive crop damage to sugarcane by red rot.

### Mode of Infection

Infection may be initial using contaminated planting material, specifically setts infested with dormant mycelium or chlamydospores. Secondary infection spreads within fields by irrigation water, dirty farming tools, and by dispersal of conidia of the fungus.

### Symptoms

Infected sugarcane plants have characteristic visual symptoms:

Stems form red surface blotches and red internal discoloration interspersed with white patches upon splitting. Early symptoms are the drying of the third or fourth leaf at the margins and tips. Red, oval, small lesions form on the upper leaf surface and midrib with pale yellow or whitish centers. Advanced infections produce hollowed stems, cane fragility, and acidic sour smell characteristic of the disease. White mycelial infilling of the hollowed stalks occurs at the advanced stage of the disease. At the end stage, the stalk hollows with an infilling of white mycelial growth.

### Impact of Red Rot

Red rot considerably lowers sugarcane productivity by breaking down stalk structure, heightening the danger of lodging and breakage. The disease also greatly lessens sucrose content, which directly contributes to sugar yield and processing efficacy. Economic losses are usually drastic because of both quantity and quality declines in the harvested crop.

### Favorable Conditions

Multiple environmental and agronomic factors favor the induction and development of red rot: Hot and humid weather condition, Excessive rainfall and weak field drainage, Chronic waterlogging, Recurrent ratooning and monoculture practice, Mechanical damage to stalks and Extended periods of wet seasons.

### Control Measures

A combined disease management strategy has to be applied in order to prevent the occurrence of and alleviate the effect of sugarcane red rot disease. The strategy incorporates physical, cultural, mechanical, biological, and chemical controls.

#### Cultural measures

Plant only healthy, disease-free setts. Grow resistant varieties like Co 86032, Co 86249, CoSi 95071, CoG 93076, CoC 22, CoSi 6, and CoG 5. Provide adequate field drainage to avoid waterlogging. Do not undertake ratoon cropping in infested fields. Treat planting setts with recommended fungicide solutions before planting.

#### Physical Measures

Treat setts with steam containing air at 52°C for 4–5 hours or hot wet air at 54°C for 2 hours to kill fungal inoculum.

#### Mechanical Measures

Destroy and remove infected plant parts by burning to minimize inoculum sources.

#### Biological Measures

Use beneficial bacteria like *Pseudomonas fluorescens* on setts, which will inhibit *C. falcatum* and minimize chemical fungicide use.

**Conclusions**

The Red Rot disease continues to be a significant threat to sugarcane production. Nevertheless, an active management strategy involving resistant varieties, proper cultural practices, and biological control can effectively reduce its impact. Ongoing research and education among farmers are essential to manage this key sugarcane disease in a sustainable manner.

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