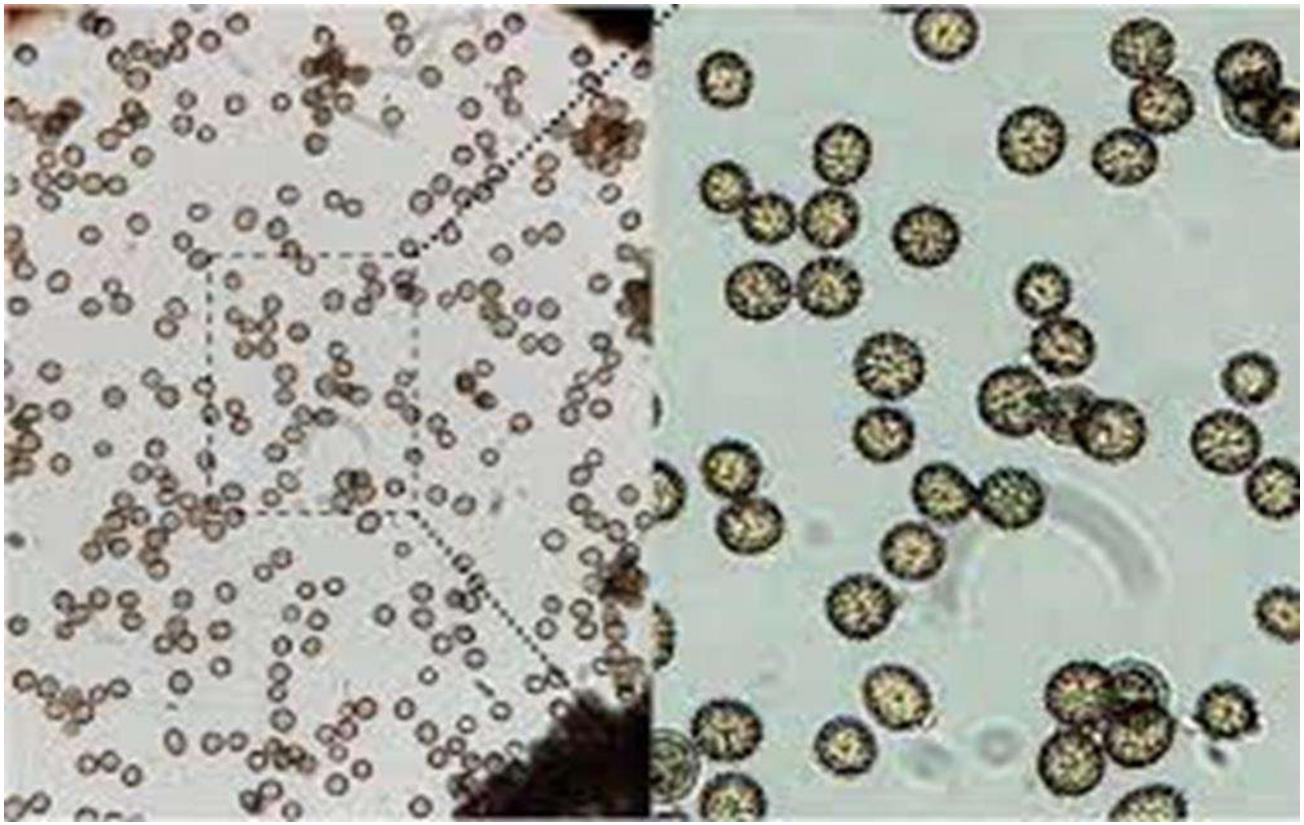
Corn smut
pathogen: *Ustilago maydis*



Corn smut symptoms

Formation of sooty galls like mushroom on the ears.

Large amounts of black teliospores of the fungus develop inside these galls and the galls rupture and release teliospores.

In severe cases entire ears will become infected with smut.

Management

A. Use resistance varieties.
B. Crop rotation.
C. Remove galls before the galls burst open and spread their spores.
D. Avoid overhead irrigation, since the splashing may spread the smut. Use drip irrigation if possible.
E. Use a balanced nitrogen because high nitrogen fertilizers may increase the severity of the disease.

Stalk rot diseases

Anthracnose stalk rot

Fusarium stalk rot

Diplodia stalk rot

Charcoal rot

Bacterial stalk rot

Giberella stalk rot

Symptoms: Initial symptoms of stalk rots are noticed by premature wilting and ear drop.

As the disease progresses stalks senesce rapidly and turn brown to gray.

Symptoms: Shiny black coloration on outside of stalk and dark rotting inside the stalk.

Management

A. Use resistance varieties.
B. Crop rotation.
C. Bury infected residue can help decrease the amount of disease inoculum.
D. High nitrogen fertilizers may increase the severity of the disease — use a balanced nitrogen.
E. Foliar fungicide.

Ear rot diseases of maize

- Fusarium ear rot
- Gibberella ear rot
- Diplodia ear rot
- Aspergillus ear rot
- The disease reduces maize yield, nutritional value of infected grains and may induce the development of mycotoxins also it affects the maize quality

Fusarium ear rot

pathogen: *Fusarium verticillioides*

Symptoms: Diseased kernels are scattered or in patches on the ear, especially on kernels damaged by European corn borer, earworm, or bird feeding.

Ears with Fusarium ear rot have white to purple mold visible on kernels. Also fusarium produce fuminosin toxin.

Gibberella ear rot
Pathogen: *Fusarium graminearum*

Gibberella ear rot produces a pinkish mold that often begins at the ear tip.

On severely affected ears, the husks and silks may adhere tightly to the ear because of mold growth — such ears are called “mummified ears.

This fungus produces two different mycotoxins: deoxynivalenol sometimes called vomitoxin and zearalenone.

Aspergillus ear rot
Pathogen: *Aspergillus flavus*

Aspergillus ear rot appears as an olive-green mold on the kernels.

The fungal spores appear powdery and may disperse like dust when you pull back the husk.

These signs are most commonly observed at the tip of the ear, but can be scattered throughout the ear and all the way to the base of the ear.

Also aspergillus produce aflatoxin.

Diplodia ear rot

Pathogen: *Stenocarpella maydis*

The Diplodia ear rot fungi produce a dense white to gray mold that appears on and between the kernels at the base of the ear and progresses toward the tip.

Management of ear rot diseases

Quarantine.

Control alternate hosts.

Planting resistant hybrids.

Crop rotation .

Rice diseases and their pathogens

Bakanae	*Fusarium moniliforme*
Brown spot	*Bypolaris oryzae*
Black kernel	*Curvularia spp.*
Rice blast	*pyrecularia oryzae*
Kernel smut	*Tilletia barclayana*
Bacterial leaf blight	Xanthomonas oryzae pv oryzae

Bakanae symptoms

The disease occurs at any stage of rice growth but its most damaging at seedling stage.

- Infected seeds may fail to germinate.
- Infected seedlings show brown rot at the base.
- Affected seedlings wilt and die.
- Infected rice plants appear conspicuously taller than other healthy plants.
- Infected rice plants produce few tillers, no grain and wither after sometime.

1- Bakanae disease

Bakanae symptoms

Bakanae symptoms

Management

1- Clean seeds should be used to minimize the occurrence of the disease.

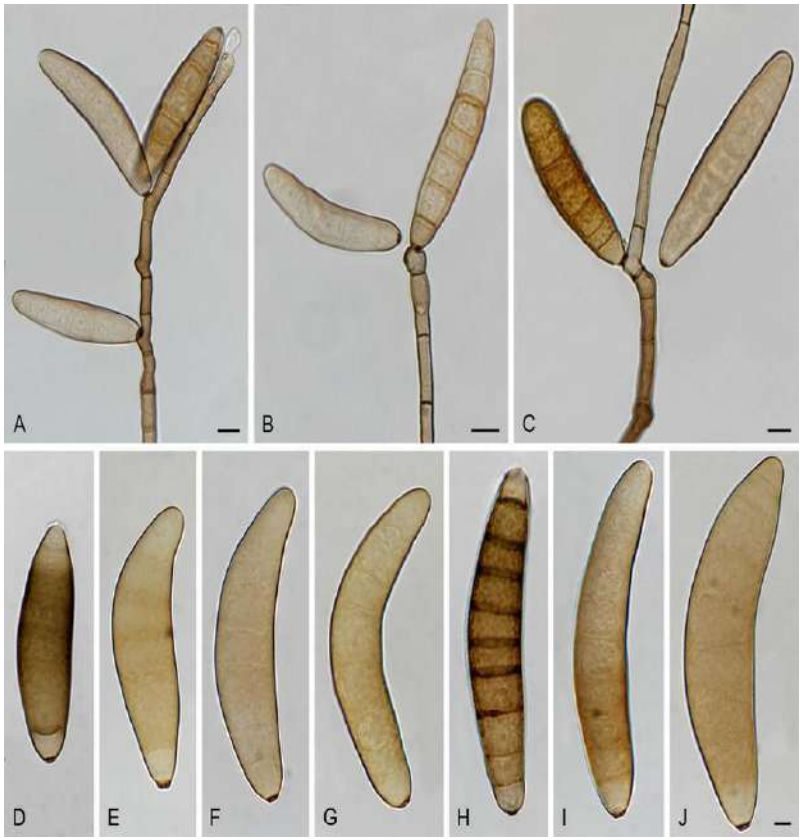
2- Salt water can be used to separate lightweight, infected seeds from seed lots and thereby reduce seedborne inoculum.

3- Seed treatment with thiram and bavistin

4- Seed dressing by *Pseudomonas florescence* and *Trichoderma spp.*

2- Brown spot

Bypolaris oryzae



Brown spot symptoms

Brown spot symptoms

The symptom begins on leaves as small brown spots, which then develop into round or oval brown spots in later stages.

Seedling blight can occur when infected seeds are used.

Eye spot symptoms on rice grains

This disease also damages rice grains, causing brown spots and black discolouration on the grains.

Management

1- Use disease free seeds.

2- Remove infected rice straw and weed hosts

3- Use of resistant varieties where available.

4- Soils known to be low in plant-available silicon should be amended with calcium silicate slag before planting and the field should be well irrigated to avoid water stress.

5- seed treatment with fungicide like **thiram**, **benomyl** and **bavistin** also seed dressing with **Pseudomonas florescence and *Trichoderma spp.***

6- Hot water seed treatment (53-54°C) for 10-12 minutes may be effective before sowing.

3- Bacterial blight of rice: Symptoms begin as stripes on leaf blades. The stripes increase in length and width, become yellow and later become whitish with wavy margins.

They may coalesce to cover the entire leaf blade. The leaves dry and die. Infected plants produce fewer and lighter grains, and the grain is of poor quality.

Detection of *Xanthomonas oryzae pv oryzae*

Culture media test

Ooze test

Management

Weed control.

Seed treatment with copper oxychloride or copper sulfate.

Use clean, certified and resistance varieties of seeds.