

Diseases of Barely

Fungal diseases	
Leaf rust	<i>Puccinia hordei</i>
Stripe rust/ yellow rust	<i>Puccinia striiformis</i> f. sp. <i>hordei</i>
Leaf stripe	<i>Bipolaris graminea</i>
Loose smut	<i>Ustilago nuda</i>
Cover smut	<i>Ustilago hordei</i>
Bacterial diseases	
Bacterial kernel blight	<i>Pseudomonas syringae</i> pv. <i>syringae</i>
Bacterial leaf blight	<i>Pseudomonas syringae</i> pv. <i>syringae</i>
Basal glume rot	<i>Pseudomonas syringae</i> pv. <i>atrofaciens</i>
Nemic diseases	
Root-knot	<i>Meloidogyne</i> spp.
Viral diseases	
Barley mosaic	<i>Barley mosaic virus</i>
Barley stripe mosaic	<i>Barley stripe mosaic virus</i> (BSMV)

Loose Smut

Causal organism: *Ustilago nuda*

Symptoms

Symptoms of barley loose smut are similar to those of wheat loose smut. Until ear emergence affected plants often do not exhibit symptoms. Infected heads usually emerge before healthy ones and all the grain is replaced with a mass of dark brown spores. The spores are initially loosely held by a thick membrane that soon breaks releasing the spores onto other heads. Finally all that remains is bare stalks where the spores once were.



Disease Cycle:

Infection during flowering is favoured by frequent rain showers, high humidity and temperatures of between 16-22°C. There are no visible signs of infection as the fungus survives as dormant hyphae in the embryo of the infected seed. When infected seed germinates the fungus grows within the plant. As the plant elongates the fungus proliferates within the developing spike and spores develop instead of healthy grain. Eventually the wheat head is replaced by a mass of spores, ready to infect healthy plants.

Control

Using systemic seed treatments every year will effectively control this disease. Following a loose smut outbreak in a crop new clean seed should be sourced.

Covered Smut

Causal organism: *Ustilago hordei*

Symptoms

Affected plants usually do not show symptoms until ear emergence. Infected ears typically emerge at the same time or slightly later than that of the healthy stems. Also, infected ears often emerge through the sheath below the flag leaf. All of the florets of infected ears are replaced by masses of dark brown to black spores. The spores of covered smut are held more tightly than those of loose smut.



Disease Cycle

During harvest the spores of affected heads spread and contaminate healthy grain. At sowing the smut spores germinate at the same time as the seed and infect the germinating plant. Infection of seedlings is favoured by earlier sowing as the fungus prefers drier soils and temperatures of 15-21°C. The fungus grows systemically within the plant, usually without producing symptoms and then it replaces the young grain with its own spores.

Control

Covered smut of barley can be effectively controlled by using fungicide seed treatments every year. Following infection new seed should be obtained from a clean source. Resistant varieties should be used.

Diseases of Sorghum

Fungal diseases	
Anthracnose (foliar, head, root and stalk rot)	<i>Colletotrichum graminicola</i> <i>Glomerella graminicola</i> [teleomorph]
Charcoal rot	<i>Macrophomina phaseolina</i>
Rust	<i>Puccinia purpurea</i>
Target leaf spot	<i>Bipolaris cookei</i>
Bacterial diseases	
Bacterial leaf spot	<i>Pseudomonas syringae</i>
Bacterial leaf stripe	<i>Burkholderia andropogonis</i>
Nemic diseases	
Root-knot	<i>Meloidogyne spp.</i>
Viral diseases	
Maize dwarf mosaic	<i>Maize dwarf mosaic virus</i>

Diseases of Millet

Fungal diseases	
Bipolaris leaf spot	<i>Bipolaris setariae</i>
Cercospora leaf spot	<i>Cercospora penniseti</i>
Curvularia leaf spot	<i>Curvularia penniseti</i>
Bacterial diseases	
Bacterial spot	<i>Pseudomonas syringae</i>
Bacterial leaf stripe	<i>Acidovorax avenae</i>
Nemic diseases	
Root-knot	<i>Meloidogyne incognita</i> <i>Meloidogyne javonica</i>
Viral diseases	
Maize dwarf mosaic	<i>Maize dwarf mosaic virus</i>