



**Bugiyanya Zonal Agricultural
Research & Development Institute**



Wheat Diseases and their management



Background: Wheat (*Triticum eastivum* L), basically a temperate crop, is adapted to the south western highlands of Uganda in the districts of Kisoro and Kabale and, in eastern Uganda on the slopes of Mt. Elgon in Kapchorwa, Sironko and Mbale districts.

Fungal diseases:

1. Leaf Rust (Brown Rust) caused by *Puccinia recondite*.

Symptoms: The pustules are circular or slightly elliptical, smaller than those of stem rust, usually do not coalesce, and contain masses of orange to orange-brown urediospores. Infection sites primarily are found on the upper surfaces of leaves and leaf sheaths, and occasionally on the neck and awns.

Importance: Severe early infections can cause significant yield losses, mainly by reducing the number of kernels per spike, test weights, and kernel quality.

2. Stem Rust (Black Rust) caused by *Puccinia graminis f.sp. tritici*.

Symptoms: Pustules (containing masses of urediospores) are dark reddish brown, and may occur on both sides of the leaves, on the stems, and on the spikes. With light infections the pustules are usually separate

and scattered, but with heavy infections they may coalesce. Prior to pustule formation, "flecks" may appear. Before the spore masses break through the epidermis, the infection sites feel rough to the touch; as the spore masses break through, the surface tissues take on a ragged and torn appearance. As plants mature, masses of black teliospores may be produced.

Importance: If infection occurs during the early crop stages, the effects can be severe: reductions in tillering and losses in grain weight and quality. Under favorable conditions, complete crop loss can occur.

3. Stripe Rust (Yellow Rust) caused by *Puccinia striiformis*.

Symptoms: The pustules of stripe rust, which, contain yellow to orange-yellow urediospores, usually form narrow stripes on the leaves. Pustules also can be found on leaf sheaths, necks, and glumes.

Importance: Severe infections can cause yield losses, mainly by reducing the number of kernels per spike, test weights, and kernel quality.

4. Powdery Mildew caused by *Erysiphe graminis f. sp. Tritici*.

Symptoms: On all hosts, the first visible symptoms of this disease are white to pale gray, fuzzy or powdery colonies of

mycelia, and conidia on the upper surfaces of leaves and leaf sheaths (especially on lower leaves), and sometimes on the spikes. Older fungal tissue is yellowish gray. This superficial fungal material can be rubbed off easily with the fingers. Host tissue beneath the fungal material becomes chlorotic or necrotic and, with severe infections, the leaves may die. Eventually, black spherical fruiting structures (cleistothecia) may develop in the mycelia, and can be seen without magnification.

Importance: Powdery mildew can cause major yield losses if infection occurs early in the crop cycle and conditions remain favorable for development so that high infection levels are reached before heading.

5. Common Root Rot, Foot Rot, and Crown Rot caused by *Helminthosporium*, *Fusarium*, and *Pythium spp.*

Symptoms: These fungi produce a darkening or browning of the root, crown, and basal culm tissues. Individual plants or groups of plants may lodge. White spikes often are visible just prior to normal physiological maturity. Infection early in the crop development can cause pre- or post-emergence "damping off" of seedlings. Since each fungus can attack a different plant part at a different growth

stage, positive field identification of the causal agent is difficult.

Importance: Major epidemics have not been reported. However, localized losses can result from thinned stands, a decrease in the number of tillers, and from reductions in head size and test weights.