

Gibberella ear rot

CAUSAL ORGANISM

Fungus: *Gibberella zeae* (*Fusarium graminearum*)

COMMON NAMES

Head blight of maize; scab of maize; ear rot of maize; gibberella ear rot; red ear rot; pink ear rot; cobweb disease; *Graminearum* ear rot

HOST RANGE

Primary hosts include:

Avena sativa (oats), *Glycine max* (soybean), *Hordeum vulgare* (barley), *Lupinus* spp. (lupins), *Nicotiana tabacum* (tobacco), *Oryza sativa* (rice), *Pennisetum glaucum* (pearl millet), *Secale cereale* (rye), *Sorghum bicolor* (sorghum), *Triticum aestivum* (wheat), *Zea mays* (maize).

Secondary hosts include:

Brassica spp., *Gossypium* spp. (cotton), *Lycopersicon* spp., *Medicago* spp. (medic), *Panicum miliaceum* (millet), *Phaseolus vulgaris* (common bean), *Pisum* spp. (pea), *Solanum* spp. (nightshade), *Trifolium* spp. (clovers), *Triticale* spp., *Vicia faba* (broad bean).

SYMPTOMS

A pink to reddish (Fig. 2) mould usually starting at the tip of the ear is characteristic of *Gibberella* ear rot (Fig. 1). Unless infection occurs early in the season, entire ears are seldom colonised. Early infected ears may rot completely with husks and silks adhering tightly to the ear with mould growth developing between husks and ears. Superficial blue-black, speck-sized perithecia occasionally develop on the husks and ear shanks.

DISEASE INFORMATION

G. zeae overwinters in maize debris and is also associated with debris of many other hosts. Inoculum produced on wheat during epidemics of wheat scab may be important.

Maize ears are generally susceptible only when they are very young. Cool, wet weather within three weeks of silking favours disease development. The fungus infects silks, grows into the ear progressing downward during grain fill. Infection of the base of the ear may also occur with heavy rainfall late in the season, especially in hybrids where the ear does not turn down and water collects between the husk and the kernel. Disease may be more severe in fields previously planted to maize or wheat especially if debris remains on the soil.

IMPORTANCE

Gibberella ear rot is a common problem in maize production areas worldwide and also in South Africa. Damage is caused by direct loss of yield (0.9-33%) due to ear rot and by the production of mycotoxins that are harmful to humans and livestock. Storing grain at high moisture levels and temperatures leads to storage rot and production of mycotoxins. Damage is most critical when mycotoxins are produced at levels that are toxic and unsuitable for human and livestock consumption. *F. graminearum* is well known to produce mycotoxins and in South Africa zearalenone (ZEA), deoxynivalenol (DON or vomitoxin) and nivalenol are common. Zearalenone is an estrogenic mycotoxin causing problems in piggeries where it affects the hormonal system of sows causing fertility problems. Chickens are less sensitive to zearalenone, while cattle are also sensitive, but to a lesser extent than pigs. High levels of DON and nivalenol cause feed refusal in pigs and cattle and even vomiting at high levels. Chickens are less sensitive to DON. T2 toxin is another toxin produced by *G. zeae*, however, only found in the northern hemisphere, not in South Africa.

SIMILARITY TO OTHER DISEASES

Pinking of white maize can be confused with the genetic/environmental interaction not caused by a disease (refer to Physiological Disorder fact sheet).



Figure 1. Initial symptoms starting at tip of ear.



Figure 2. Pinkish mould usually starting at the tip of the ear.

CONTROL

Cultural control:

- Hybrids differ in their resistance to *Gibberella* ear rot.
- Ears with loose, open husks are often more susceptible than those with good husk coverage.



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