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Fusarium cob rot of corn

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Fusarium ear or cob rot can be a serious disease of all corn types. The disease has recently appeared in New South Wales in sweet corn and maize crops. The various fungi that cause the disease infects sweet corn and maize cobs, causing a yield reduction in both. Toxins produced by the fungus in maize can also have serious implications to the end use of the grain.

Fusarium *infected cobs of maize (above) with affected grain (below).*

Fusarium, *commonly associated with sweet corn cobs, usually as a result of splitting kernels.*

Cause

Fungi belonging to the genus *Fusarium* are capable of causing cob rots. For Fusarium cob rot, the species that cause infection include *F. verticillioides*, *F. proliferatum* and *F. subglutinans*. Cob rot caused by *Gibberella zea* (asexual state *F. graminearum*) is often called Gibberella cob rot. These fungi can also cause stalk rot. Other fungi can cause cob rots including species of *Penicillium*, *Diplodia* and *Aspergillus*. These will not be addressed in this Primefact.

Symptoms

Fusarium cob rot

Fusarium cob rot caused by *F. verticillioides*, *F. proliferatum* and *F. subglutinans* is characterised by white fungal growth covering either individual kernels or, in serious cases, covering the entire cob. Streaking of seed, often called ‘starburst’ is another symptom characteristic of infection by these *Fusarium* species. The streaks or white lines run across the kernels and are most likely on some kernels on cobs every year without being noticed. *Fusarium* species are found within the plant without causing symptoms (endophytic).

Similar symptoms are caused by *Diplodia* cob rot, so correct identification by a plant pathologist is important.

Apart from the reduction in yield caused by these fungi, *F. verticillioides* and *F. proliferatum* can also produce a group of mycotoxins called fumonisins. Horses and pigs are very susceptible to these mycotoxins and consumption of the grain contaminated with fumonisins has also been linked to oesophageal cancer in humans.

This issue is important as the end use of the product may be directly influenced by the level of mycotoxin in the grain. In the case of sweet corn, the presence of any form of cob rot will render the crop unsuitable for human consumption. With maize, the end use will be influenced by the level of fumonisin in the sample.

Gibberella cob rot

Gibberella cob rot infection is characterised by pink fungal growth over the kernels. It is more commonly found on maize cobs. The mycotoxins zearalenone, deoxynivalenol (DON) and nivalenol (NIV) are produced by this fungus. These can affect various animals so they must be monitored and managed as well.

Source of infection

The fungi survive from season to season in plant residue. Some may be seed borne.

Spread of infection

The fungi spread via spore infection through the silks, roots and stalks, and through cobs damaged by insects, especially by the corn ear worm, *Helicoverpa*. However the fungi can also be found commonly within corn plants without causing obvious symptoms.

Factors that favour disease

Fusarium cob rot caused by *F. verticillioides* and *F. proliferatum* is usually associated with high temperatures and moisture stress. This rot is commonly found in central to southern areas of the state such as the Murrumbidgee Irrigation Area. Cob characteristics such as pericarp thickness and the extent that the husk covers the end of the cob (reducing moisture infiltration) also play a role.

Another factor that can increase infection is damage from insects. If there are heavy infestations of *Helicoverpa*, *Fusarium* infection levels can be high.

Kernel splitting favours *Fusarium* development.

Gibberella cob rot is often favoured by wet conditions so is commonly found in the north of the state.

Control

Varieties can differ in their susceptibility to Fusarium and Gibberella cob rot. Seed companies rate varieties according to their susceptibility to cob rots. Check seed company ratings before buying seed. Make sure the varieties are suited to your region, e.g. the climatic conditions. Good integrated pest and disease management programs can reduce the risk of infection. These would include pest management, rotation, and increasing stubble breakdown.

Maintaining good irrigation management has also been implicated in reduced development of *Fusarium*. Maintain adequate soil moisture during silking, and right up to harvest.

For sweet corn avoid over irrigation towards harvest as kernel splitting and subsequent *Fusarium* infection may develop. Also avoid delays in harvesting sweet corn as this also encourages kernel splitting and *Fusarium* development.

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