

Biosecurity feature - part four

Pests that we don't have and don't want - Sugarcane downy mildew

Downy mildew was once a major disease of sugarcane in Queensland. It was eradicated from commercial fields in Queensland in the 1950s, but is still one of the most serious diseases of sugarcane in Papua New Guinea and the Philippines. In this article BSES staff Rob Magarey, Principal Researcher based at Tully, Barry Croft, Program Leader, Biosecurity based at Woodford, and Nader Sallam, Researcher based at Gordonvale give us the ins and outs of this disease.

Sugarcane downy mildew can be caused by one of several species of fungi. However, *Peronosclerospora sacchari* and *P. philippinensis* are considered the fungi of concern to commercial sugarcane crops. *P. philippinensis* also causes a serious disease of corn in the Philippines. The United States lists this fungus as a bioterrorism threat because of its potential to damage their corn industry.

Spores of these fungi invade the sugarcane plant on hot humid nights, landing on buds and young leaf tissues at the base of the leaf spindle. The fungi enter the stalk tissue and move through the cane plant to infect newly developed leaves, which in time develop the characteristic leaf striping symptoms.

Below: Downy mildew photographs.



Distribution

The disease is found in some South East Asia countries and the Pacific islands but is most common in Papua New Guinea (PNG) and the Philippines. In PNG, downy mildew is common in both wild and cultivated sugarcane.

Plant symptoms

Typical symptoms of downy mildew are leaf streaks 1–3 mm wide, which are separated by normal green leaf tissue. Initially these streaks are pale creamy-yellow in colour, but as they age the streaks turn yellow and then assume a mottled brick-red colour. On warm humid nights the fungus produces a soft white down on the underside of leaves. Infected plants are stunted, unthrifty and can fail to ratoon. Yield losses of 40% or more are common in susceptible varieties. Occasionally the fungus causes the plant to produce tall thin stalks that stand out above the rest of the crop; these are known as 'jump-ups'.

Reproduction and dispersal

Downy mildew spreads through spores that form on hot humid nights. The spores are very fragile and die a few hours after sunrise. Because the spores are so fragile and short-lived, they only travel short distances.

Downy mildew infects a wide range of grasses, including corn, and the disease can spread from these grasses into sugarcane. One of the main ways that the disease spreads over longer distances is through movement of infected planting material, and this poses the greatest risk for re-infecting Australian crops.

Control

Planting resistant varieties is an excellent way of managing and ideally eradicating downy mildew. Growers in countries where the disease occurs need to ensure that planting material is free of the disease and also keep grasses that may harbour the disease under control. The fungus can be eliminated from planting material by hot water treatment or by applying the fungicide metalaxyl.