

Sugarcane smut

Introduction

Sugarcane smut is one of the most serious diseases of sugarcane. Affected cane is severely stunted and production losses of 30-100% are common in susceptible varieties. The loss of susceptible varieties causes major disruption to plant breeding programs. Sugarcane smut occurs in all sugar industries except those in New Guinea and Fiji (and other South Pacific islands). The disease was found for the first time in Australia in the Ord River Irrigation Area of Western Australia in July 1998, and was recorded for the first time on the east coast of Australia in the Isis mill area near Childers in Queensland in June 2006. Smut is now present in all regions of the Australian sugar industry.

Causal organism

The disease is caused by a fungus, *Ustilago scitaminea*. The fungus infects plants through buds on standing stalks or germinating buds in the soil. The fungus grows in the plant in close association with the growing points or meristems.

Symptoms

Sugarcane smut is easily identified by the black whip-like structure that forms from the growing point of the sugarcane plant. This whip replaces the spindle leaf. Whips are formed in shoots developing from infected cane cuttings, cane that is infected from spores attached to the bud, shoots developing in contaminated soil and from side-shoots developing on mature stalks. The whip has a thin membrane that breaks to release the mass of black spores. When all spores are blown or fall from the whip, the straw colored core of the whip remains. Abnormal whips that contain some flower parts can sometimes be formed. Before the whip forms there is some shortening and crinkling of the youngest leaves. Infected plants are usually stunted and individual stalks are thin with a grass-like appearance.

Yield loss

Sugarcane smut can cause total crop loss in susceptible varieties. Losses have been estimated for a range of varieties at 0.6% loss for every 1% increase in the number of infected plants. In susceptible varieties, plants will die making ratoon crops unprofitable, necessitating early plough out and replanting.



Typical smut whip and thin grassy shoot.



Smut can cause severe stunting and stool death.

Spread

Sugarcane smut is primarily spread by wind dispersal of the spores or by planting infected or contaminated cane cuttings. The majority of spores usually spread only a short distance such as 10-15 meters. However, in gale force winds or cyclones spores can travel many kilometres. Movement of spores on machinery and shoes is also possible.

The spores can only survive for 2-3 months in moist soil but for longer periods in dry soil or other dry environments. The fungus can survive within infected cane plants as long as the plant remains alive. It requires a living plant to produce spores.



Management

Resistant varieties are the main method for managing sugarcane smut. Resistance ratings for commercial varieties in Australia are available from QCANEselect (sugarcane.com.au). The level of resistance required may vary between regions. Smut is favored by dry warm climates. In the Ord River Irrigation Area, which has an ideal climate for smut, only highly resistant varieties can be grown. Varieties with intermediate to resistant ratings can be grown in most regions and some susceptible varieties can be grown in the wet tropical areas and wetter parts of southern districts. Highly susceptible varieties should not be grown in any region.

Hot water treatment of cane can be used to eliminate smut from infected planting material. Treatment at 52°C for 30 minutes can give 98% control and the long hot water

treatment of 50°C for 3 hours is also effective. Softening of the buds during hot water treatment can make the buds more susceptible to re-infection from spores in the soil. A fungicide dip after hot water treatment can reduce this risk. Throttle® Tyrant® and Sinker® are registered fungicides.

For further information

If you want further information on sugarcane smut, contact SRA on 07 3331 3333 or your local adviser.

References

Comstock, J.C. (2000) Smut. In A guide to sugarcane diseases Ed. P. Rott, J.C. Comstock, B.J. Croft and A.S. Saumtally. CIRAD/ISSCT, Montpellier.

