

WHIP SMUT OF SUGAR-CANE

Pathogen: *Sporisorium scitamineum (Ustilago scitaminea)*

Systematic position of pathogen: Class-Basidiomycotina; Class- Teliomycetes; Order- Ustilaginales; Family- Ustilaginaceae.

Distribution and Importance: This disease has been reported from several sugar- cane growing countries such as West Indies, Cuba, Mauritius, Java, Philippines, South Africa and Australia. In India, the disease is found chiefly in the north, but occurs practically wherever cane is cultivated.

Symptoms: Affected plants are characterized by the production, from the growing apex of a long whip-like dusty, black shoot, often several feet in length and much curved on itself. The whip-like part of cane is devoid of leaves, slender and flexible. Generally it represents a floral shoot. In the earlier stages, the whip remains covered by a silvery-white, thin membrane, which soon ruptures exposing a dense black dust, consisting of the spores (smut spores) of the fungus. No secondary shoots arise from the upper portion of the affected cane; however, from the lower part of the cane they are often fairly abundant, and may be prolonged into spore bearing organs. Generally the whip is found in those varieties which do not flower.

The pathogen: The whip smut of sugar-cane is caused by *Sporisorium scitamineum (Ustilago scitaminea)*. The tissues of the cane below the whip smut itself contain the intercellular mycelium. The hyphae are found in dense masses towards the surface of the spore-bearing shoot where the spores are formed. As the spores are produced in great abundance under the sheath, they rupture it, throwing it off in flakes and shreds. The spores are spherical, echinulate, light brown in colour, measuring 6.5-8.5 μ in diameter. The smut spores are intermingled with the groups of colourless, thin-walled sterile cells. The spores are disseminated by wind and they readily germinate in water or moist earth producing a two or three-celled promycelium from which terminal and lateral sporidia arise. The sporidia are narrow, elongated, straight, single-celled bodies joined to the promycelium by a short stalk.

Disease Cycle: The disease is seed-as well as soil-borne. It can be transmitted through setts cut from diseased plants containing mycelium, as well as through spores that are in the soil. The mycelium of the fungus survives in the ratooned stumps of diseased canes and fresh shoots which arise from such stumps are invariably smutted.

Management:

- 1. Rogueing.** The smutted whips should be collected carefully in the sterilized bags, and burnt outside the field. The entire infected clump should be dug out and burnt.
- 2. Avoid ratooning.** The ratooning of infected crop should always be discouraged.
- 3.** Remove infected stalks and destroy all residues of infected plants
- 4.** Avoid sowing of susceptible varieties such as Co. 300, Co. 301, Co.312, Co. 313, Co. 290, and Co. 299
- 5.** Sett Treatment before sowing. To ensure disease- free seeding material, dip sugarcane cuttings in 52 °C hot water bath for 30 minutes.
- 6.** The resistant varieties should be sown. Some resistant varieties are Co. 356, Co. 395, Co. 421, Co. 453, Cos. 76 and Cos.109.

