

Smut Of Crops: A Review

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Review Article

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ABSTRACT

Plant-diseases are always the points of great interest; a disease plant cannot perform the whole function, so that the overall yield of the crop is also much reduced, sometimes the plant disease are the reasons of the famines of the cultures. Rust, smut, powdery mildew, downy mildew, spots and the other diseases always were the reasons of the great economic losses of the farmers. In this review article we are presenting some of the aspects of the smut diseases of the crops. Smut word has been taken from the Greek language and the meanings of the smut spores are the sooty spores with the dark black appearances generally in the ovary and in the other parts of the body of the plant part. Smut are the members of the Basidiomycetes of the order ustilaginales, they always cause the devastating effects on the plant part or the crops, some time the smut are the region of the famine of any particular area or the places. Control measures of the smut are the classical, resistant varieties as well as the modern biotechnological approaches in the routine practisers, however till now there is not any permanent solution of the disease have been discovered.

INTRODUCTION

Plant pathology is the branches of the sciences which is concerned with the causal agents of the diseases as well as their epidemiology and the control measures. In the plant diseases a plant cannot perform their normal functional and the all parts of the plant are affected by the infection of the fungus or any other causal organisms, depending on the severity of the diseases as well as the weather conditions [1,2]. The fungi form lower group to the higher group are always causes some or any other ways many kinds of the diseases on the differ plants. These are classified as the rust, smut, mildew, powdery as well as the downy mildew and the spots and the other diseases of the fungi imperfecti [1].

Basidiomycetes are the class of the fungi which is the assemblage of the many kinds of the group of the unnatural assemblage, in this categories some of the fungi are seen which have the complete deterioration of the sexual reproduction and they are presented by the only some fibres like structure in the plants rust are the diseases of the uridinales [1]. They are generally heterocious and they complete the life cycles on the two alternate host with Macroyclic life cycle pattern [2]. In this group here Basidium form with four basidiomycetes and they form in the large fruiting bodies basidiocarps of the differ shapes [1].

Here in this review article we are presenting some of the aspects of the one of the **diseases entitled as the smut, smut is the Greek word and they represent the dark black colours in the reproductive bodies**, here generally the reproductive organ are replaced by the dark full patches of the dark spores of the carbon colour and when the spores are crushed they appears like the ash [2]. The members of the order ustilaginales commonly known as the smut fungi, all these fungi are the biotrophic organism, it has been reported that about there are 50 genera off the smut fungi there and around 1000 species of the smut fungi reported. Originally the disease was considered as the minor disease but later on the for the wheat of the smut the united nations have to developed the quarantine departments (**Figure 1**) [1].

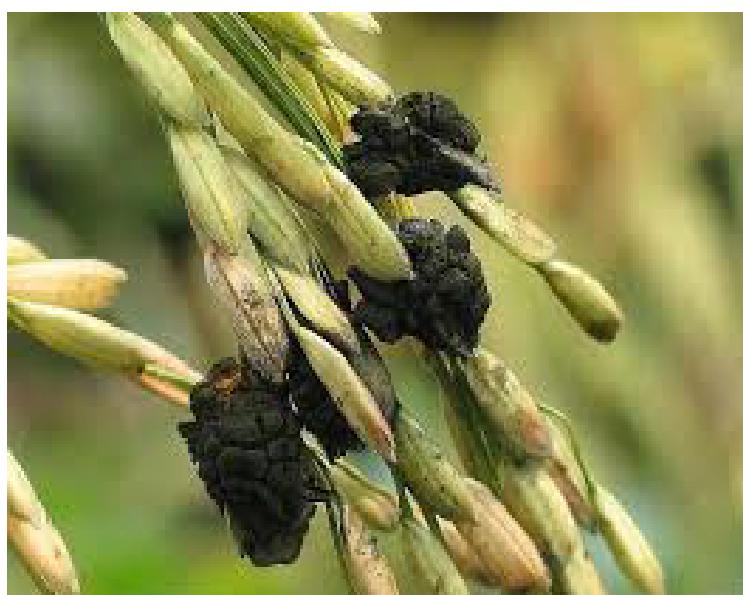


Figure 1. Smut spores on the Rice plants (source: Rice knowledge bank).

In nature the dikaryotic life cycle of the smut fungi appears on the host organisms. When fungi infects the plants, it appears like the systemic infections however in some hosts the fungi has the perennial infections, in which the host survives in the winter as well. New growth of the hosts later on with the fungi perennation [2]. In contrast to the rust fungi the smut fungi are the typical contains the life cycles on the same hosts plants [2]. Teliospores sizes, shape and the colour and the ornamentations is the features of the taxonomic values [2]. The ornamentation of the spores are of the taxonomic values, they have been often used for the identification of the species (**Figure 2**) [4].

Common Smut Disease Cycle (*Ustilago maydis*)

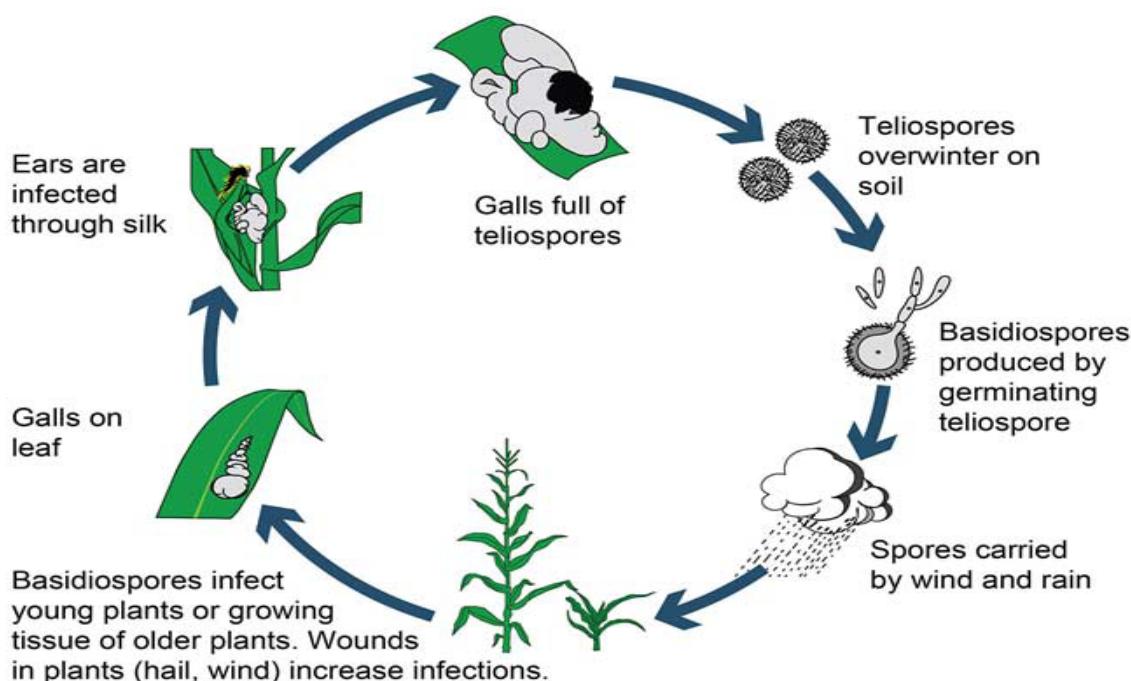


Figure 2. smut of corn (sources: Pioneer.com).

Most smut fungi attack the ovaries of the hosts, however several of the smut fungi attack the leaves and the stem and the other part of the plants. Some of the smut fungi have the external infections as well as the some smut fungi attacks the internal seedlings [2]. Smut fungi never kill their hosts but the growths of the hosts are effected very much, they become stunted [4].

Most smut fungi produce the two kinds of spores, these are the teliospore and the basidiospores. Teliospores are formed in the galls of the ovary of the host plants, from them the basidiospores bud off and they spread the infection to the plant [3]. Basidiospores are not borne on the stigmata as in the other typical basidiomycetes. The most common smut fungi are enlisted as: ***Ustilago maydis***: smut of corn [1].

Ustilago avenae*, *Ustilago nuda*, *Ustilago tritici: are the smut of the cereals.

Ustilago scitamenea: smut of the sugarcane. ***Tilletia*** genus as the covered smut or the bunt of the wheat, ***sphaeacelotheca sorghi*, *sphaelotheca reliana*** are smut of the sorghum.

Urocystis: onion smut.

Neovossia: karnal smut of rice.

Entyloma: leaf smut of rice.

Smut generally overwinters as the teliospores on the seeds, on the plant debris, as well as in the soil [1].

Loose smut of wheat: wheat is the common crop of India as well as the other part of the world. It is the staple food of the India, however the crop of the wheat is effected by the many kinds of the fungi, one of them is the smut, the genus of the smut is the ***Ustilago tritici***, the mycelium of the fungus is the straight and septate and have the Basidium as the time of the reproduction, loose smut of the wheat is worldwide in distribution [1]. Loose smut destroys the crop by destroying the whole of the crop by the means of the kernels [4].

Loose smut produces the symptoms only when the plant reaches the maturity and produces the head. All the kernels as well as the other part of the plants are whole smutted [5].

Pathogen is the ***ustilago nuda*** and the ***ustilago tritici***, have the mycelium turned in to the teliospores which germinate in to the basidium of one to four cells [6].

Diseases cycles : The pathogen overwinters as the dormant mycelium in the kernels of the seeds when planted the kernel mycelium become active and spread in to the whole of the plants, as the pathogens matures it turns in to the spores which are blown by the winds from one plant to the another (**Figure 3**) [7].

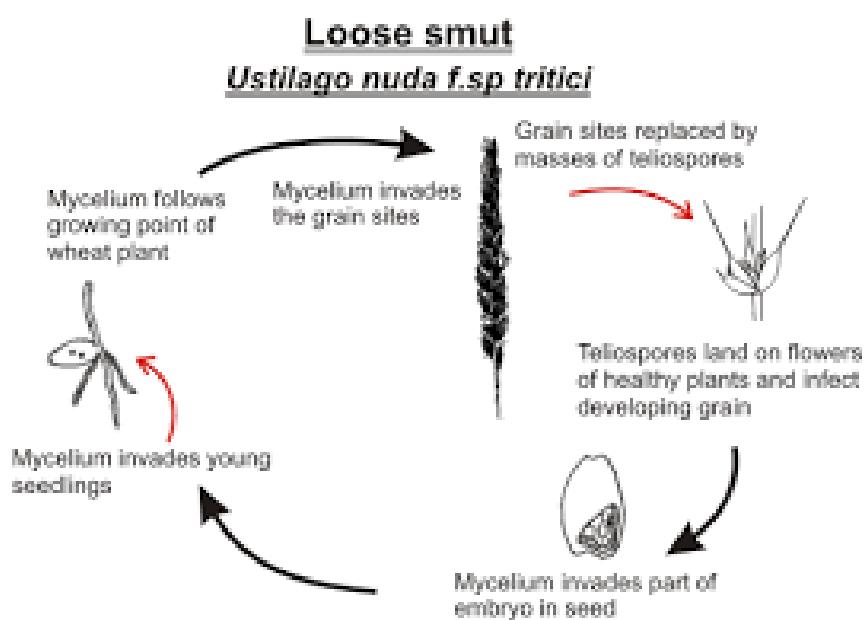


Figure 3. loose smut of the wheat (sources AHDB cereals and crops).

Control of smut: There are number of the ways by which the smut of the wheat is controlled, some of these control measures are enlisted as

- 1) By the treatment of the fungicides like the carboxin, carboxanilides, these chemicals are absorbed and are spread systematically on whole of the plants.
- 2) The best means of the smut control by the use of the smut free certified seeds.
- 3) Sometimes the hot water treatment is another means of the control fungi.

CONCLUSION

Overall the smuts are devastating fungi of the plants. They coevolved with the plants, however till now there is not any satisfactory result of the smut fungi, only temporary solutions of the diseases are available, so this review articles represents the some of the aspects of the smut which is useful to the students of the plant pathology.

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