

False Smut (*Ustilaginoidea Virens* (Cke.) Tak.): A Serious Major Constraint in Rice (*Oryza Sativa* L.) Production

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The rice false smut is a worldwide disease and already changed from a minor disease to a major disease in many rice-growing countries in Asia since 1970. It has been found in many countries, viz; China, India, Japan, Italy, Australia, Philippines, Brazil and Myanmar [1, 2]. Rice false smut disease was also found to occur severely in BRRI dhan49 during Aman season with remarkable yield losses in Bangladesh. With the change of weather condition, large application of nitrogen fertilizer and large-scale planting of hybrid rice, the rice false smut has become more and more serious. Outbreaks of this disease often occur in cold weather and reduce the grain quality and yield [3], and late sowing and application of high doses of Nitrogen also favours the development of disease [4].

The highest disease incidence (61.20%) and yield loss (14.18%) were reported [5], and yield losses caused by RFS (rice false smut) disease is attributed to both smut balls as well as chaffiness, reduction in grain weight and infertility of the spikelet near the smut balls [6]. The false smut balls have toxin including ergot alkaloid toxin that can cause rumination stopping in cows, suppress the tubulin of mammals and cause necroses of liver, kidney, and bladder tissues in mice [7, 8].

The false smut (chlamydo-spores) contains mycotoxins (ustiloxins) that are toxic to animals and contaminate rice seeds and grains [4]. The chlamydo-spores survive in winter in the soil and become a primary source of infection of the rice plants [3]. The chlamydo-spores germinate on coleoptile epidermal cells of rice seedlings, and infected hyphae invade intercellular spaces and reach at the meristematic tissues of rice plants [3]. In addition, the scientists [9] confirmed in greenhouse tests that rice seedlings grown from infested seeds were infected by *U. virens*. However, confusion remains about the disease cycle and infection process in rice false smut [10]. Moreover, false smut not only threatens rice production in yield and quality but also produces toxins that are dangerous to human health and livestock.

Significant effect in controlling severity of false smut was observed with Potent 250 EC (Propiconazole 0.1%) as reported [11]. Researchers [12] reported that two sprays of 50% propiconazole EC at 300 g a.i. ha⁻¹ and of 10% difenoconazole GR at 225 g a.i. ha⁻¹, exhibited the best control of rice false smut. Treated seed with trifloxystrobin (Trilex 2000), and propiconazole plus trifloxystrobin (Stratego) were also effective in reducing false smut with foliar application at the heading stage [13]. Efficacy of indore isolates of *Trichoderma* spp. against *U. virens* showed significant antagonistic potential [14].

The integrated use of fungicides and good agricultural practices appear to be effective for management of false smut disease of rice.

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