

# New Head-Scab of Tall Fescue in United States Caused by *Fusarium heterosporum*

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## ABSTRACT

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Head-scab of tall fescue (*Festuca arundinacea*), a new disease in the United States, caused by *Fusarium heterosporum* was discovered on the pasture plots of the University of Missouri South Farm, Columbia, on 23 September 1981. The pathogen had been described previously in Europe and the United States as a head blight of grasses and cereals but not on tall fescue.

A previously undescribed head-scab disease of tall fescue (*Festuca arundinacea* Schreb.) caused by *Fusarium heterosporum* Nees ex Fr. (teleomorph: *Gibberella gordonii* Booth) was discovered for the first time in the United States on 23 September 1981 on the South Farm research pasture plots of the University of Missouri at Columbia. The disease was first observed in the field because of the eye-catching orange color of numerous affected seed heads. Closer examination of the seed heads revealed the presence of sporodochia. Sclerotia of *Claviceps purpurea* (Fr.) Tul. were also present on some infected seed heads.

One-hundred infected and 100 apparently healthy seeds were surface-sterilized in a 1:5 (v/v) solution of Clorox and water for 10 minutes, placed on moist filter paper in petri dishes, and incubated in the dark at 28 C for 10 days. The seeds were examined daily. None of the diseased seed germinated, and only 38% of the symptomless seed produced a radicle equal to or greater than twice the length of the caryopsis. No attempt was made to correlate seed viability and the presence of the fungus in the seed.

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Orange sporodochia from individual seeds contained masses of macroconidia. No microconidia were observed. Macroconidia were four- to six-celled and measured 2–5 × 25–40 μm. Each macroconidium was slightly curved, sharply pointed at the apex, and had a distinct foot cell.

Cultures obtained from single macroconidia from seed were submitted to Dr. Amy Rossman (USDA, APHIS, Hyattsville, MD 20782), who identified the fungus as *F. heterosporum* (*personal communication*). Cultures were also sent to the Fusarium Research Center, Pennsylvania State University, where Nancy L. Fisher confirmed the identification; Dr. T. A. Toussoun and Dr. P. E. Nelson further stated (*personal communication*) that the cultures were identical, both in conidia and cultural morphology on carnation leaf agar and potato-dextrose agar, to a culture of *F. heterosporum* from the Biologischen Bundesanstalt in West Berlin.

Single macroconidia were cultured on potato-sucrose agar made as recommended by Booth (1), but at 28 C and without light the fungus produced microconidia and no recognizable macroconidia. The discrepancy between the presence of macroconidia produced on the host (seed) and the lack of production in our initial isolations can be explained by the fact that light is necessary for the production of macroconidia (4). Transfers from stock cultures incubated in the light produced typical macroconidia.

According to Wollenweber and Reinking (6), *F. heterosporum* is a

cosmopolitan species that causes a head blight on the caryopses and glumes of grasses and cereals in Europe. They stated that the pathogen was frequently found associated with *C. purpurea*. Cunfer (3) isolated *F. heterosporum* from *C. purpurea* honeydew on *Paspalum distichum* L. at Experiment, GA. He also found that *F. heterosporum* colonized and killed some ovaries of inoculated *Secale cereale* L. florets but that the fungus was weakly pathogenic in comparison with *C. purpurea* (3). Booth (1) found that the germination of seed was affected by *F. heterosporum*.

A search of the literature (2,5) revealed that no disease of fescue caused by *F. heterosporum* has been reported in the United States. Dr. C. Bacon, USDA-ARS, Athens, GA 30604, who works with diseases of fescue, stated (*personal communication*) that he has never observed nor read of any *Fusarium* species causing a head-scab or head-blight of fescue in the United States. We hypothesize that a new strain of *F. heterosporum* was introduced into the state. This pathogen in Missouri may pose a serious threat to the tall fescue seed industry (worth more than 15 million dollars annually). It is interesting that many of our new diseases turn up on research farms. Growers and consumers should be aware of this new disease.

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