AgriLIFE EXTENSION
Texas A&M System

PLANT PATHOLOGY & MICROBIOLOGY

PLPA-Co-010-02

Head Smut of Corn

Symptoms

Head smut is a systemic disease of corn that starts at seedling stage, and remains asymptomatic until the plant reaches its reproductive stage. Symptoms consist of conspicuous galls that replace ears or tassels. The galls are covered by a very fragile membrane that breaks early and easily, exposing masses of dark brown spores, teliospores, and vascular bundles (Fig. 1). The consistency of the membrane and the presence of vascular bundles are what differentiate head smut from common smut. Once the membrane is broken, wind and rain spread the teliospores into neighboring soil where they stay viable for several years.

Causal Agent

Head smut is caused by the pathogen *Sphacelotheca reiliana* (syn. *Sorosporium reilianum, Ustilago reiliana, Sporisorium holci-sorghi*). Teliospores of *S. reiliana* are circular, spiny, and dark brown to black in color. Several races of *S. reiliana* have been recognized that affect hosts including maize, sorghum, Sudan grass, Johnson grass, and teosinte.

Inoculum Source and conditions

Soil-borne teliospores are the main inoculum source. Teliospores survive in soil for several years, and are the source of the mycelium that penetrates through the seedling root, invades the meristematic tissue, and develops systemically.

The plant remains asymptomatic until it reaches the reproductive growth stages, when the pathogen replaces ear and tassel tissues. Ear and Tassel tissues may be partially or totally replaced by the membrane covered mass of teliospores.
Dry and cool weather that delays seedling growth favors the early stages of this disease. Once in the plant, dry and warm conditions (70-86°F) favor fungal development.

Management

• Plant resistant varieties. Select Hybrids that are fast to emerge, thereby escaping infection.

• Plant early, when temperatures are unfavorable for spore germination.

• Treat seeds with systemic fungicides. Protective fungicide seed treatment gives only reduced control.

• Maintain balanced soil fertility.

• Where feasible, remove and burn smutted tassels and ears as they emerge to reduce inoculum spreading.

• Only long rotations may be effective due to the longevity of teliospores in soil.

Fig.1. Vascular bundles and masses of teliospores replace the ear. Photo: Ronald French.

Prepared by Dr. Ronald D. French[1](rdfrench@ag.tamu.edu) and Dr. Diana Schultz[2]
[1]Assistant Professor and Extension Plant Pathologist (Amarillo, TX) [2]Plant Pathologist (Fort Myers, Florida)
Texas AgriLife Extension Service; The Texas A&M System
March 1, 2010