Management Of Fusarium Head Blight (Scab Of Wheat)

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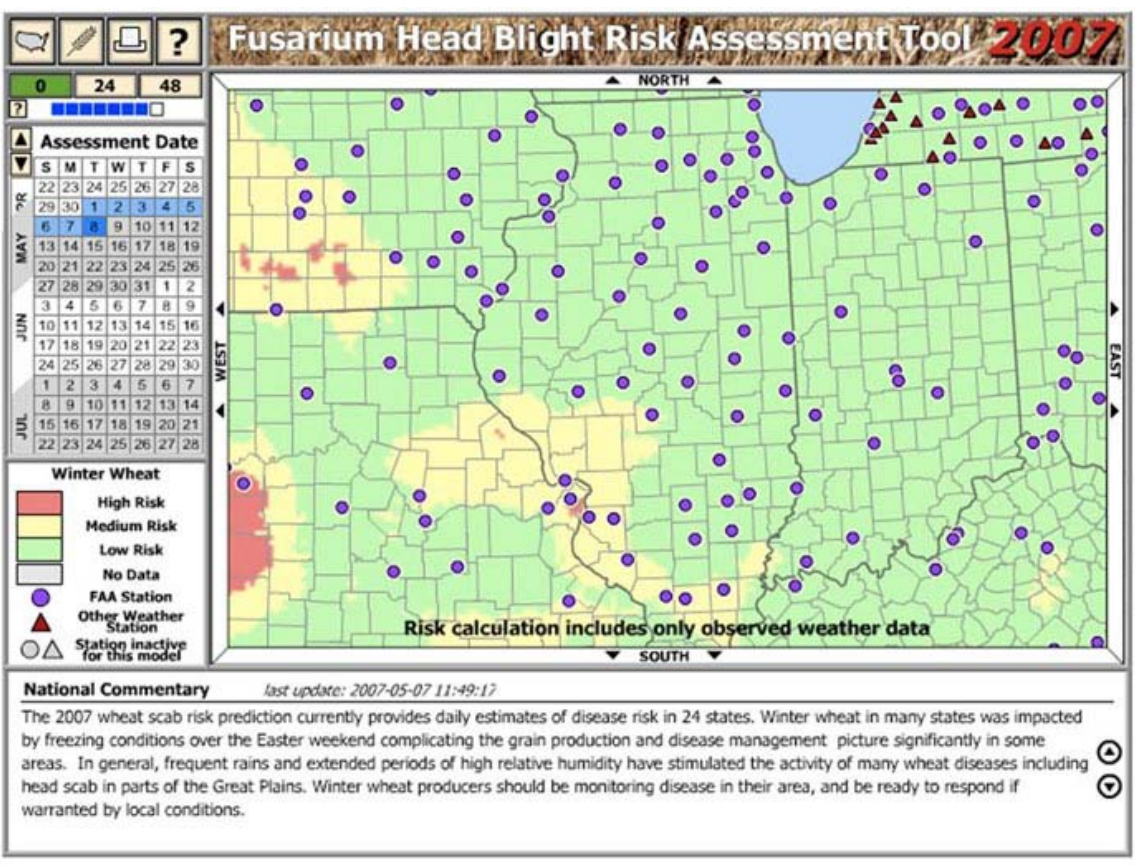
Fusarium head blight (aka scab) can be one of the most devastating diseases of wheat when conditions are favorable for it. Scab can cause both yield and quality losses. Quality losses can be due to lower test weights and contamination of grain by toxins (i.e., deoxynivelanol, or DON) produced by the fungus that causes Fusarium head blight; both can be a serious problem for producers and millers.

Because the fungal pathogen that causes Fusarium head blight (Fusarium graminearum, also known as Gibberella zeae) can also affect corn, causing Gibberella stalk and ear rot, the pathogen is already present throughout Illinois in many fields. Weather is generally the driving factor in the development of Fusarium head blight. Because wheat is susceptible to the disease during flowering, the weather conditions from flowering through kernel development play a key role in the incidence and severity of scab. Moderate temperatures (75 to 85°F), prolonged high humidity, and prolonged wet periods favor disease development. A disease forecasting system – the Fusarium Head Blight Risk Assessment Tool – based on weather conditions is available online. A "risk map" can be obtained that shows the risk of Fusarium head blight throughout Illinois (and other states). This forecasting system was developed through collaboration by many university plant pathologists and funded through the U.S. Wheat and Barley Scab Initiative.



Screen capture of the Fusarium Head Blight Risk Assessment Tool from May 2007.

By the time symptoms of Fusarium head blight appear on wheat heads, which can be observed as "bleached" heads or heads with both green and bleached areas, it is too late to manage the disease. Successful scab management requires an integrated approach and begins prior to planting when producers decide which varieties to plant and which fields to plant into wheat.

Resistant varieties. Although no wheat varieties are immune to Fusarium head blight, some are more resistant than others. Dr. Fred Kolb's wheat-breeding program at the University of Illinois has rated varieties for Fusarium head blight severity under high-pressure environments over multiple years. These ratings are available online at the University of Illinois Variety Testing site, in the "Small Grains" section.

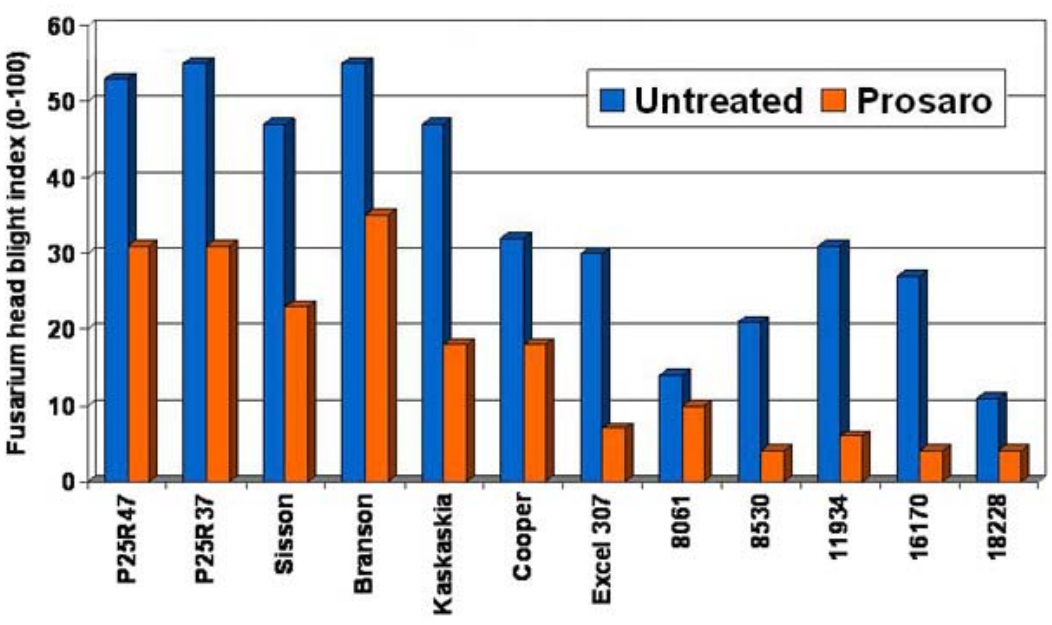
Cropping sequence. Because corn stubble can harbor the Fusarium head blight pathogen, wheat following soybean is at a lower risk of developing the disease than wheat following corn.

Foliar fungicides. The use of foliar fungicides is the only "in-season" option for control of Fusarium head blight. Although fungicides are a good control option, losses will still occur on a highly susceptible variety sprayed with a fungicide in an environment favorable for disease. A University of Illinois field research trial conducted at Urbana in 2008 evaluated the effect of fungicides on 12 different wheat varieties that ranged from susceptible to moderately resistant to Fusarium head blight. In this trial, the best control was achieved when resistant varieties received fungicide applications. On susceptible varieties, Fusarium head blight levels were still as high as 35% even after a fungicide was applied. It is important to note that this trial had very high disease pressure – it was inoculated with the Fusarium head blight pathogen and the trial was mist-irrigated to provide a very favorable environment for disease.

Timing of fungicide application is very important to get the best control. Fungicides should be applied at Feekes growth stage 10.5.1 (early anthesis, when the anthers are just beginning to extrude from the head). It is also important to spray with nozzles oriented to spray forward, which helps improve fungicide coverage of the wheat head.

Symptoms of Fusarium head blight on wheat ("bleached" heads).

Due to several fungicide registrations after the 2008 season, 2009 is the first time Illinois growers have several effective fungicide products available for control of Fusarium head blight. The North Central Regional Committee on Management of Small Grain Diseases (NCERA-184) has developed a fungicide efficacy table for wheat diseases (Adobe PDF, 80kb). Based on multistate and multiyear data, this table rates the effectiveness of the available fungicide products for control of Fusarium head blight and other diseases. It is important to note that only a few fungicides have Fusarium head blight listed on their labels, and these are only triazole fungicides (Prosaro, Caramba, Folicur, and a few others). Products that contain a strobilurin fungicide (Headline, Quilt, TwinLine, Stratego, and others) can be applied earlier in the season to help protect against foliar diseases, but they should never be applied when heads are present. In some instances, strobilurin fungicides applied later in the season can cause an increase in DON toxin contamination in grain, so it is important to never apply strobilurin fungicides at the later growth stages. Δ



The effect on Fusarium head blight of Prosaro fungicide compared to an untreated check in 12 wheat varieties differing in disease susceptibility. Wheat varieties range from susceptible to moderately resistant (L to R). The trial was conducted at Urbana in 2008 by Drs. Carl Bradley and Fred Kolb, University of Illinois.

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