

Karnal Bunt

A Disease of Wheat



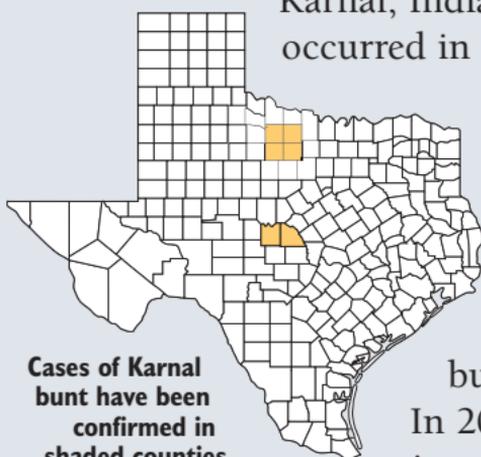
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Karnal bunt (*Tilletia indica*) is a fungal disease that affects wheat, durum wheat and triticale. The disease is sometimes called partial bunt because only part of the kernel usually is affected.

Karnal bunt was first discovered in 1930 in Karnal, India. Since then it has occurred in Pakistan, Iraq, Nepal, Afghanistan, Mexico and the United

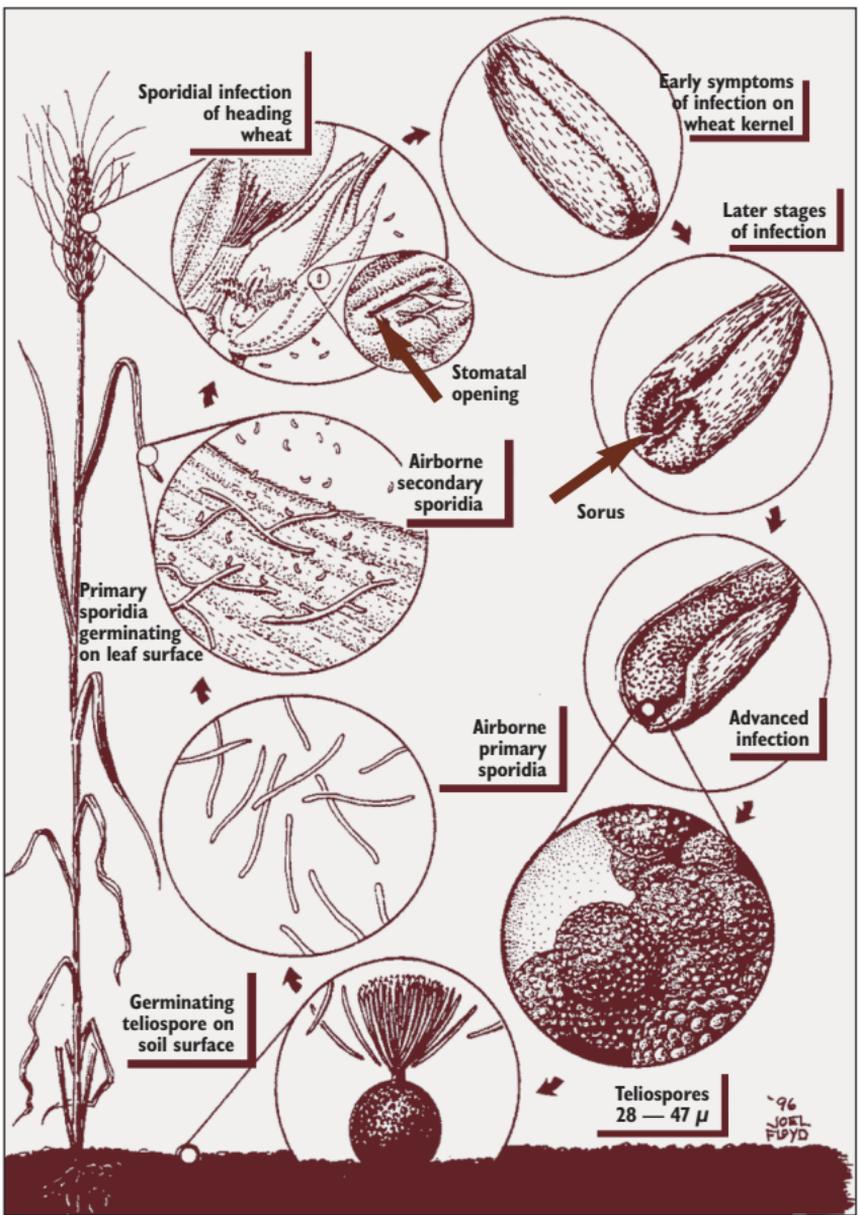
States. The first U.S. occurrence was in Arizona in 1996. In 1997 Karnal bunt appeared in Texas.

In 2001 it was reported in six counties.



Cases of Karnal bunt have been confirmed in shaded counties as of 2002.

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The life cycle of Karnal bunt fungus.

Life Cycle

The disease produces three types of spores. Teliospores are found on or in the soil. When they germinate they produce primary sporidia. These spores may be blown by wind or splashed by rain onto wheat plants. When primary sporidia germinate they produce secondary sporidia—the spores that germinate and penetrate the wheat glumes. Mycelia grow down to the base of the glumes and up into developing kernels. Masses of black teliospores



then develop in infected kernels. The fungus infects one or more developing seed on a head, but usually not all the seed. The dusty black teliospores release the chemical trimethylamine, which has a fishy odor.

Karnal bunt is most apt to develop when temperatures are between 60 and 70 degrees F, humidity is greater than 80 percent, the weather is cloudy, and rainfall or irrigation occurs during late boot, heading and flowering.

Disease Spread

Karnal bunt spreads mainly through the movement of infected grain. However, teliospores can be carried on machinery, trucks, animals, and anything that disturbs and moves the soil. Large numbers of teliospores must be present to cause reliable infection. Primary sporidia also can spread Karnal bunt when they are carried by wind and water.

Control

Integrated control measures can, over time, reduce the number of teliospores to an insignificant level. Controlling irrigation during heading and flowering, deep plowing, and planting cover crops will help some. Because there are no resistant varieties of wheat, where Karnal bunt has occurred nonhost crops such as barley, oats or rye may be planted instead of wheat.



Seed treatments can eliminate many of the viable spores on the seed but do not protect wheat plants from infection if the seed are planted in infested soil.

Foliar fungicides applied between late boot and flowering can reduce the incidence of Karnal

bunt, but applying fungicides on a routine basis is often cost prohibitive.

Importance to the Industry

From a production standpoint, Karnal bunt is a minor disease because it has little effect on grain yield. However, it has a major effect on grain marketability. Many nations prohibit the importation of wheat from regions of countries where Karnal bunt is known to occur. Therefore, Karnal bunt is a major threat to the wheat industry.

For testing information contact the Texas Department of Agriculture at <http://www.agr.state.tx.us>.

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