CIMMYT MR
International Maize and Wheat Improvement Center

Priority Briefing

Wheat blast disease: a deadly and baffling fungal foe

Wheat is a pillar for global food security, providing 20 percent of protein and calories consumed worldwide and up to 50 percent in developing countries. However, widespread cultivation of wheat has also fostered numerous wheat parasites that can infect and lay waste to entire farming regions.

One of the most fearsome and intractable in recent decades is wheat blast, caused by the fungus *Magnaporthe oryzae.*

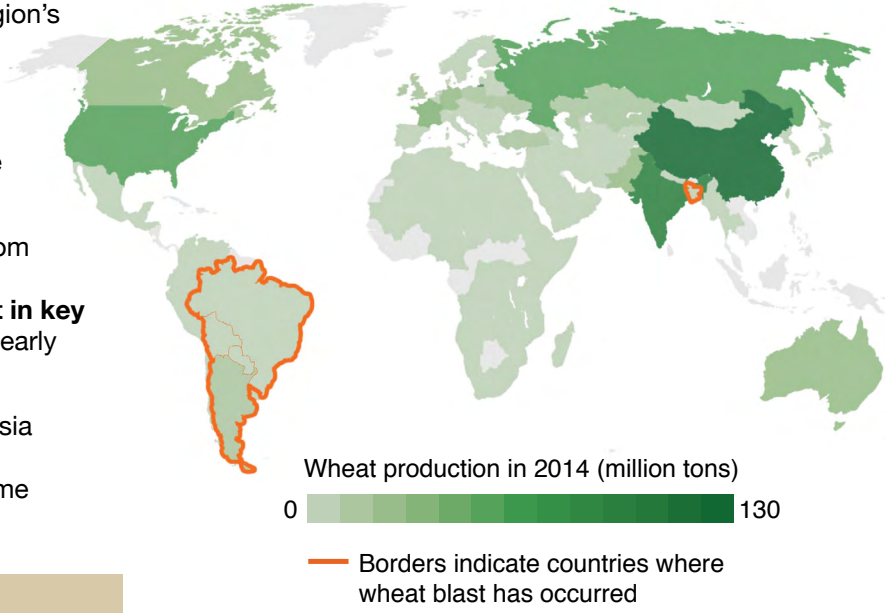
First sighted in Brazil in 1985, blast is widespread in South American wheat fields, affecting as much as 3 million hectares in the early 1990s and seriously limiting the potential for wheat cropping on the region's vast savannas.

The pathogen can be spread by seed, and also survive on crop residues. Currently, most varieties being planted are susceptible and fungicides have not been effective in controlling the disease.

Experts had feared the possible spread of blast from Latin America to regions of Africa and Asia where conditions are similar. **A severe outbreak of blast in key wheat districts of southwestern Bangladesh** in early 2016 has confirmed the truth of these predictions.

The consequences of a wider outbreak in South Asia could be devastating to a region of 300 million undernourished people, whose inhabitants consume over 100 million tons of wheat each year.

Map: Wheat-producing countries and presence of wheat blast



How to control the spread of wheat blast disease:

1. Improved wheat varieties that carry genetic resistance to *M. oryzae*.
2. Global monitoring of disease appearances, movement, and evolution, in coordination with local governments and research agencies, as well as predictive models.
3. Advanced studies on potentially effective, safe, and affordable chemical control measures.
4. Genetic and epidemiological research to strengthen knowledge of the fungus and its interactions with wheat and other host plants.

To put this integrated solution into practice, in 2011 CIMMYT led the launch of a global **Wheat Blast Consortium** comprising 13 institutions from Europe and the Americas.

For more information or to participate or contribute, contact:

Hans Braun, Director, CIMMYT Global Wheat Program; CGIAR Research Program WHEAT: h.braun@cgiar.org

Mike Listman, Senior Communications Officer, CGIAR Research Program WHEAT: m.listman@cgiar.org

www.CIMMYT.org **www.WHEAT.org**

Wheat blast: key features

Strikes directly to shrivel and deform wheat grains, leaving farmers no time to act.

Fungicides provide only a partial defense, are often hard to obtain or use in blast areas, and must be applied before symptoms appear.

Grows on numerous other plants and crops, so rotations can only partially control it.

Outbreaks are occasional and hard to predict, making it more difficult to make preparations or breed resistant varieties.

The fungus is so physiologically and genetically complex that, after more than three decades of research, it is still not understood how it interacts with wheat or which genes confer durable resistance.

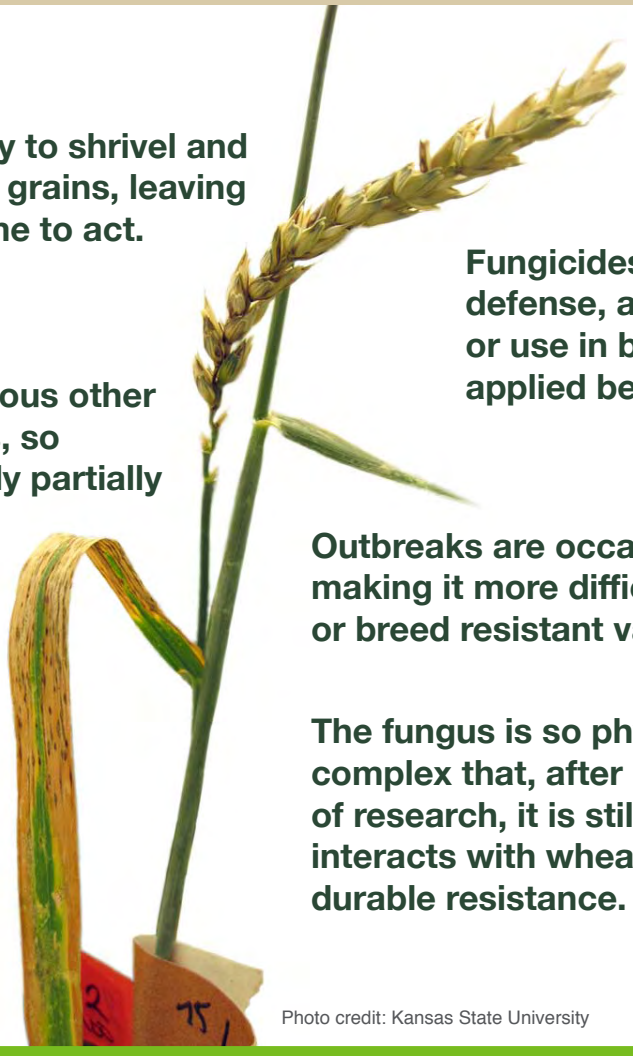


Photo credit: Kansas State University

Selected reading on wheat blast

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