Top wheat experts call for scaling up efforts to combat Ug99 and other wheat rusts

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Wheat experts from 26 countries warn that rapidly-moving, wind-borne transboundary wheat diseases continue to threaten food security and wheat genetic diversity worldwide — particularly in the ancient breadbasket stretching from the Middle East to India — as they vowed new action to isolate and interrupt the steady march of dangerous wheat rust diseases.

Of particular concern is the emergence in East Africa of a destructive and virulent strain of black stem rust known as Ug99, which has quickly crossed the Red Sea and moved into the Arabian Peninsula and West Asia. It now appears en route to South Asia, the world's most populous region, where wheat is essential to survival.

The proposed global rust reference laboratory, which was embraced in Aleppo at the Borlaug Global Rust Initiative (BGRI) Coordination Conference, will house a unique collection of all the world's known races of stem (black) rust, yellow (stripe) rust, and brown (leaf) rust in a secure containment facility.

Dr. Mahmoud Solh, Director General of the International Center for Agricultural Research in the Dry Areas (ICARDA), a BGRI partner and conference host, said such a global reference laboratory will be used as a repository for new virulent races of the rust pathogen, facilitating the identification of new sources of resistance in wheat, as a site for race identification and analysis, and as an important location for training scientists from national programs.

Dr Solh said these highly mobile, wind-borne, transboundary wheat diseases have the potential to endanger global production of a crop that feeds 2 billion people.

"For example, the black stem rust Ug99 is alarming because 80 percent of the world's wheat varieties are susceptible," said Dr. Solh. "But other types of wind-borne wheat rust could quickly affect the food security of millions of households in poor rural areas where wheat is literally the bread of life."

The Declaration issued at the end of the Aleppo meeting referred to the increasing danger stem rust now poses to wheat production and diversity, especially as the mapped trajectory of the destructive and virulent strain of black stem rust Ug99 shows it moving into the highly productive wheat belt that stretches from the Middle East to India. Wheat strike (yellow) rust epidemics have gained new momentum in the same areas, including the land where wheat first emerged as a domesticated crop.

"The Middle East is the cradle of agriculture - where wheat cultivation began," the Declaration states. "This area is a great reservoir of breeding material and wild relatives of wheat that are vital for developing wheat varieties to combat many threats including drought (and) climate change…"

The Declaration also cites the need to "develop early warning, seed production and delivery systems, and collaboration to allow us to anticipate wheat rust threats in the future as well as manage existing threats such as Ug99." Discussions at the conference identified key gaps in the current knowledge of rust diseases, and opportunities to use biotechnology and modern communications capabilities to track and combat rust diseases faster and more efficiently.

Dr Ronnie Coffman, vice-Chair of the Borlaug Global Rust Initiative

(BGRI), said the conference is part of a series of coordinated actions focused on transboundary wheat rust diseases that have flowed from the BGRI, whose permanent members include ICARDA, CIMMYT (two of the CGIAR centers), FAO, the Indian Council for Agricultural Research (ICAR), and Cornell University.

"The BGRI is named after Nobel Prize Laureate Norman Borlaug, whose work (decades ago) in combating an earlier stem rust invasion is credited with helping launch the Green Revolution. It is Borlaug's call to action that has rallied a diverse array of scientists, governments and international institutions to combat this new generation of wheat rusts," Dr Coffman said.

BGRI activities are funded by an array of donors including USAID, USDA, CIDA-Canada, AFESD-Arab Fund, IFAD, the Indian Council for Agricultural Research (ICAR), FAO, ACIAR-Australia, PIEAES and Government of Sonora, Mexico, Syngenta Foundation, The Bill & Melinda Gates Foundation (supporting the largest project on Durable Rust Resistance in Wheat) and other donors. In addition, national programs have been investing significantly through in-kind contributions to combat wheat rusts.

The BGRI, coordinated by Cornell University, now includes researchers and government agriculture officials from every wheat-growing region in the world.

Dr. Coffman said that efforts in BGRI started in 2005 and already resistant material has been identified through the BGRI partnership, and resistant varieties have been released in Ethiopia and Egypt.

However, he warned: "We are running against time to ensure development of durable resistant varieties and to fast-track seed production and delivery systems to reach farmers quickly, and stay

ahead of these fast-moving wind-borne diseases. In addition to our technical work, strong political support is needed at national, regional and international levels."

Source: ICARDA