

New wheat rust looms

UG99 — it even sounds bad.

That's the name of a new race of wheat stem rust that USDA Agricultural Research Service scientists say is on the march worldwide.

Discovered first in Uganda in 1999, Ug99 has spread across much of the wheat-growing areas of East Africa. It recently jumped the Red Sea, from East Africa to Yemen on the Arabian Peninsula. Now it is perfectly positioned to move on to Egypt, the Middle East and Asia.

U.S. plant scientists say that it's only a matter of time before the spores will reach North America.

Ug99 poses a threat to wheat and barley not seen since the 1950s, say scientists, when strains of stem rust reached epidemic proportions and destroyed 40% of the spring wheat crop in North America.

Scientists are so worried about Ug99 that they say it is a pathogen that could stop Norman Borlaug's Green Revolution in its tracks, leaving much of the world drastically short of food.

Key Points

- New stem rust Ug99 threatens wheat production worldwide.
- Ug99 started in Africa and has spread to the Middle East.
- Researchers say in time it will show up in the U.S.

The Global Rust Initiative was formed in 2005 to fight the spread of Ug99. Two international organizations are leading the initiative. The U.S. has been involved from the start. Now Australia, Canada, India, Egypt, Ethiopia, Iran, Kenya, South Africa, Sudan, Turkey, Uganda and Yemen are joining the group.

Fighting back

So far, the Global Rust Initiative has focused on training plant pathologists around the world to monitor for rust, identifying new rust races and testing breeding lines from all parts of the world in Kenya to see if any are resistant to the new race.

In the U.S., plant breeders hope that data from the Kenyan field-screening nursery will give

NEW RUST: Stem rust infects wheat. A new race out of Uganda is spreading and is said to pose a threat worldwide.

them a head start on developing new resistant varieties.

Southern strategy

ARS and state wheat and barley breeders are pursuing a "Southern strategy" in the U.S. to keep Ug99 at bay, says Kay Simmons, ARS national program leader for plant genetics and grain crops.

While they hope to develop resistant varieties for all of the U.S., they are focusing on varieties for Southern states — Texas, Louisiana and Georgia in particular — where stem rust will likely show up first and where it would be able to survive over a winter.

High levels of Ug99 resistance deployed in the South may prevent Ug99 from taking hold and spreading to the rest of the country, Simmons says.

As they did with soybean rust, U.S. plant pathologists also are setting up an early-warning system. They are planting sus-



PHOTO: USDA ARS

ceptible and resistant wheat varieties at multiple locations around the country to monitor for the presence of Ug99 and other new rust strains.

Moving target

Rust fighters face a daunting challenge. Not only is Ug99 tough (it has overcome nearly all known resistance genes), but it's able to change quickly, too.

Yue Jin, a plant pathologist at the ARS Cereal Disease Laboratory in St. Paul, Minn., recently confirmed that a new variant of Ug99 has occurred

in Kenya. The new form is even more virulent than Ug99, he says. It defeated resistance gene *Sr24*.

"We have to closely monitor for new forms of stem rust to make sure they cannot overcome the resistance genes we plan to introduce into wheat varieties," Jin says.

Don Comis, USDA-ARS staff writer, provided the information for this article.

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