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Researchers strive to develop stripe rust resistant wheat

As most farmers and many non-farmers know, stripe rust is nobody's friend. Seeing this dangerous disease on your crop can be devastating to a farmer's yield. The good news is, there are researchers trying to resolve this issue for you. In Manhattan, Kansas, research specialists at USDA are striving to create a wheat variety that's resistant to stripe rust.

Building 7 at the USDA Center for Grain and Animal Health Research previously housed a facility designed for wind erosion research. When the wind erosion team's original building was destroyed in 2008 by a tornado, the Agricultural Research Service constructed Building 7 at the Center in Manhattan. The building was completed in 2012, but with research funding being scarce, the wind erosion research team had to relocate, leaving the building vacant. Fortunately, with enhancements to their research budgets, the Hard Winter Wheat Genetics Research Unit (HWWGRU) was able to move their research into Building 7 in 2016. The building was recently renovated to remove the wind tunnels and construct work spaces to support wheat and sorghum genetics research.

The renovated Building 7 is around 10,000 square feet and has the best modern technology that's available. They can grow wheat year-round in their large growth room equipped with LED lights.

Mary Guttieri, USDA Research Geneticist, says, "Being able to grow wheat 365 days a year is a huge benefit to wheat research." The renovated building provides space to benefit all aspects of receiving, growing, processing, characterizing, treating, storing and shipping seeds to cooperating wheat breeding programs. Being able to do all of these projects under one roof is a huge benefit for the wheat research team.

Guttieri is doing extensive research on wheat, and a top priority is creating a wheat that will be stripe rust resistant. Doing her research in Building 7 has given her opportunities she never thought possible. With strong support from her administration, both in Manhattan and in the Plains Area, Guttieri is making breakthroughs. She can replicate the exact conditions farmers see in the field with the technology available in the research unit. Guttieri has partnered with the Kansas State University research team to collaborate. She sees Building 7 as a shared resource for research.

She said, "I want this place to be the best resource for wheat research in the region."

The Hard Winter Wheat Genetics Research Unit team has seen amazing results with the wheat that they are growing in the wheat genetics lab. With the technology enabling them to grow wheat year-round, in all weather conditions, and exposing the crop to diseases, they are continuing to learn more and more about the wheat crop.

A big goal for the Hard Winter Wheat Genetics Research Unit is to get the wheat to grow rapidly through young stages to the seed production, producing multiple generations per year, to accelerate development of new wheat germplasm. And this breeding effort is tightly coupled with DNA marker selection to ensure that the best plants are advanced in every generation. Together with her colleague, USDA Plant Pathologist Bob Bowden, materials she develops are evaluated in growth chambers and finally, in the field, to confirm disease resistance.

Guttieri said, "In the small amount we have done in field testing, the results are amazing."

With the results the Hard Winter Wheat Genetics Research Unit team has seen in the field this year under heavy stripe rust pressure, a wheat line with resistance to stripe rust should be available to farmers in the near future.