New club wheat is tough on fungi

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Cara, a winter wheat developed by ARS at Pullman, Washington. This club wheat cultivar boasts high levels of disease resistance and outstanding flour quality. Credit: Kim Garland-Campbell.

Pacific Northwest wheat growers now have added insurance against outbreaks of yield-robbing fungi, thanks to "Cara," a new, white winter club wheat cultivar developed by U.S. Department of Agriculture (USDA) scientists.

According to Kim Garland-Campbell, a geneticist with USDA's Agricultural Research Service (ARS) in Pullman, Wash., "Cara" is the product of a cooperative wheat breeding effort to combine high grain yields and flour quality with resistance to multiple fungal diseases. Of particular concern is stripe rust, a disease caused by the fungus Puccinia striiformis, which has inflicted yield losses of up to 40 percent in Washington and other Pacific Northwest states.

In fact, the release and subsequent sale of "Cara" in 2009 coincided with a stripe-rust epidemic that had overcome the resistance present in cultivars of club wheat that had been planted at the time, notes Garland-Campbell, who works at the ARS Wheat Genetics, Quality, Physiology and Disease Research Unit in Pullman. ARS is USDA's principal intramural scientific research agency.

Based on 60 yield trials conducted in plots where stripe rust was present in Oregon and Washington, "Cara" outperformed most other commercial cultivars, with two-year averages ranging from three to 18 percent better than the other wheats used in the evaluations.

"Cara," which was derived from crossing three diverse wheat germplasm sources, is primarily adapted to the Palouse and other rust-prone areas of the Pacific Northwest that receive 15 to 24 inches of precipitation annually. In addition to stripe rust, "Cara" carries genes for fungal disease resistance to straw breaker foot rot and powdery mildew.

"Cara" also scored high on standard industry evaluations for milling, baking and other end-use properties. For example, like other club wheats, flour milled from "Cara" has low viscosity and protein content, coupled with high "break flour" and "weak gluten," characteristics ideal for making air-leavened cakes, sugar snap cookies, biscuits, pastries and other soft, fluffy-textured baked goods.

More information: Read more about this research in the February 2013 issue of *Agricultural Research* magazine.

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https://phys.org/news/2013-02-club-wheat-tough-fungi.html