

New Wheat Varieties

East Coast millers may soon reap the benefits.

Last year, the U.S. Department of Agriculture's (USDA) Agricultural Research Service (ARS) created some optimism among millers up and down the East Coast when it announced the release

of "NuEast" (a hard red winter wheat) and "Appalachian White" (a hard white winter wheat).

"Millers and bakers in North Carolina as well as on the Eastern seaboard have always been interested in being able to purchase hard wheat varieties from more local sources," explains David Marshall, USDA/ARS research leader, who is based at North Carolina State University (NCSU), Raleigh.

The problem has been that developing high-quality hard wheats with the desired disease and pest resistance hasn't been easy due to the typical high-humidity or rainy conditions of the East Coast. This

also causes poor pollination.

"Presently, we aren't looking at these varieties to go full-scale into the commodity channels," adds Marshall. "These varieties are intended more for the niche markets, such as organic flours that capitalize on the locally grown appeal."

Extensive Screening Program

Marshall and his team have been working with the North Carolina Organic Bread Flour Project. The project has been examining the qualities of these varieties—grown organically and inorganically.

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Shown here in Kenya, David Marshall, wheat pathologist and breeder, USDA/ARS, also helps coordinate screening of all United States wheat and barley germplasm for Ug99 stem rust.

gram essentially at the grassroots level by trying to get millers and bakers together and seeking their input and involvement as to what they're looking for in terms of better varieties for the East Coast region," explains Marshall.

Prior to joining the ARS in 2002, Marshall had been a wheat pathologist and breeder at Texas A&M University for 17 years, which offered him some excellent insight into the diverse breeding wheat lines

of the Great Plains.

Other scientists participating in the program are Myron Fountain, USDA-ARS in Raleigh and Paul Murphy, NCSU.

Development of Advanced Lines

“For starters, we began examining and canvassing all the hard wheat breeding programs, especially in the Great Plains and Intermountain region, and the northern areas of the United States, in hopes of finding a variety or two that could be grown economically at various locations on the East Coast,” says Marshall.

Marshall and his staff examined “advanced” breeding lines from Texas A&M, Oklahoma State University, Kansas State University, Colorado State University, and the University of Nebraska.

With about 12 test plot locations up and down the East Coast, ranging as far south as Quincy, FL (located in the Panhandle) and as far north as central Pennsylvania at Penn State University.

From these test plots and observations, Marshall began targeting those varieties that exhibited good quality and disease resistance.

While this was going on, Marshall and his team also began their own breeding programs to make selections and crosses and to develop advanced and select lines of hard wheat varieties favorable to the East Coast region.

In that search, Marshall began to focus on the successful variety of TAM 303 developed at Texas A&M.

“Agronomically, this line performed well and produced a high-quality product in the Great Plains, and it produced a fairly good product when we grew this variety in North Carolina and Virginia,” says Marshall.

TAM 303 was planted on about 1,000 acres in Virginia three years ago, and about 3,000 acres were planted in late 2009 in North Carolina.

To speed up genetic development, Marshall also utilized field plots in New Zealand so that the cycle times of planting and harvesting between the two countries could be shortened.

NuEast Variety

According to Marshall, The NuEast is a cross between TAM 303 and a breeding line from Kansas State University.

While the jury is still out on its drought tolerance, this NuEast variety has exhibited very good “rust” resistance, especially to Ug99, a devastating stem rust first discovered in Uganda in 1999.

The test weight of NuEast also has been

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- David Marshall, USDA/ARS

good, being significantly higher than TAM 303, Jagalene, and Jagger hard red winter wheat varieties.

When grown in North Carolina, NuEast produced a good, hard red winter wheat quality grain and flour, according to Marshall.

Based on Marshall’s research, NuEast grain and the quality of flour produced from it performed consistently and equally as well as the Hondo, Jagger, and TAM 303 varieties during 2006-2008 field trials conducted in Georgia, North Caro-

lina, Kentucky, and Virginia.

Hondo was an adapted hard red winter wheat variety for the Mid-Atlantic states first released by AgriPro Seeds, Inc. in 1999.

Appalachian White Variety

So far, this variety has shown or exhibits a fairly high level of tolerance to “preharvest sprouting,” adds Marshall.

When compared to Lakin, another popular hard white winter wheat variety, Appalachian White’s yields were nearly 12% higher.

During field trials conducted 2007-2009 in North Carolina, the test weight of Appalachian White was good and the same as Lakin. The same was true in other field trials located in Georgia, Kentucky, Virginia, Maryland, and Delaware.

The yield and test weight of Appalachian White and Lakin were similar at all other testing locations in Georgia, Kentucky, Virginia, Maryland, and Delaware.

Appalachian White produced grain with significantly higher hardness scores and significantly higher flour protein levels than Lakin in trials spanning from 2007 to 2009.

Karl Ohm, associate editor

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