

Shuttle breeding and global genetics send wheat improvement into overdrive

Partnerships between Limagrain's US and South American wheat breeding programs are creating new options for HRS growers

FORT COLLINS, Colo., Feb. 11, 2013 - Hard Red Spring Wheat growers may not realize it, but close to a dozen breeding programs located all over the planet are supporting the development of new LCS varieties each year for markets in the Northern Plains of the United States, according to Dr. Jim Peterson, Limagrain Cereal Seeds' Vice President of Research.

Public universities and private breeding programs have been developing new varieties for many years in Minnesota, Montana and the Dakotas. When Limagrain Cereal Seeds (LCS) entered the market, the Limagrain Group's global breeding network gave wheat farmers access to the best spring wheat genetics in the world, not just in the Northern Plains.

The seeds of change were sown when LCS purchased Dr. Bob Romig's Trigen Seeds program in 2010. The ensuing LCS/Trigen wheat breeding program has been incorporating genetics from advanced Limagrain breeding programs on five different continents.

Through a combination of traditional and advanced breeding strategies including Pre-Breeding, Molecular Marker Analysis, Doubled Haploid Technology, Single Seed Descent, disease screening and end-use quality analysis, plant breeders working in these global programs create new elite varieties each year.

In 2010, Dr. Peterson put a plan in motion to manage and exploit this global germplasm base. For the LCS spring wheat program, partnerships in South America, Scandinavia, the Mediterranean region and Australia have made it possible not only for counter-season nursery exchange, but for the incorporation of a shuttle-breeding approach. Through shuttle-breeding,

two programs can make concurrent selections for disease and stress tolerance that will benefit both programs, and in time, the growers they serve.

The best genetics in the world

The life cycle required to create a new variety of wheat begins with the cross pollination of a single hybrid head, and through conventional breeding, ends 8-10 years later with the sale and distribution of purified elite foundation seed. LCS' partnership with advanced programs in other parts of the world has made it possible not only to test and exchange elite germplasm at earlier generations, but to import elite varieties with seed stocks already available for production.

In terms of disease resistance, this partnership has provided access to material that has been bred to thrive in environments with high pressure from Fusarium Head Blight, Leaf Rust, Crown and Root Rot, and bacterial diseases. This means these varieties will have new and durable resistance packages for the most prominent yield-reducing pathogens in the Northern Plains.

With advanced genetics available, regional adaptation and end-use quality become the next big hurdles. "By and large, foreign genetics usually require some level of re-combination with regionally adapted cultivars before they can succeed and compete in a new environment," said LCS HRS Senior Breeder Dr. Blake Cooper. "However, some of the South American material we've been testing were able to hit the ground running the first year we had it in trials in terms of agronomic performance."

The ability to exploit these relationships directly saves generations in the breeding cycle, and leaves a final question that is asked of all LCS elite variety candidates: "Does it have the quality required to make an end-use product?" The new LCS quality lab is in place to provide a final assessment of the milling and baking properties of these candidates before they are considered for release.

LCS' first U.S. release to come from this international partnership will be widely available to growers next year, as 2013 foundation seed stocks have already been sold out for months.

“We’re very excited about the potential of this new variety,” Cooper said. “Technical information will be available soon on our website, www.limagraincerealseeds.com – so keep watching.”

Group Limagrain was founded in France in 1942. The farmer-owned company has 7,000 employees and is the largest seed company in the European Union. Fort Collins, Colorado serves as the North American headquarters of Limagrain Cereal Seeds, the newest subsidiary of Group Limagrain. LCS has regional research stations in Washington, Indiana, Minnesota and Kansas. Visit www.LimagrainCerealSeeds.com.

For more information:

Dr. Blake Cooper
LCS Hard Red Spring Wheat Breeder
970-498-2200
blake.cooper@limagrain.com

Dr. Jim Peterson
LCS VP of Research
970-498-2200
jim.peterson@limagrain.com