

RESEARCH REMAINS TOP PRIORITY FOR TEXAS WHEAT



Over the past two years, the Texas Wheat Producers Board has contributed approximately half a million checkoff dollars to essential wheat research across the state. This research has contributed to newer, better-performing wheat varieties and a treasure-load of genetic information which will continue to grow the wheat industry in Texas. Several research projects and their respective successes will be outlined throughout this article.

Wheat Breeding Program

The goal of the wheat breeding program, led by Dr. Jackie Rudd and Dr. Amir Ibrahim of Texas AgriLife Research, is to develop high-yielding, disease and insect resistant wheat varieties that will increase producer profitability.

Success: Over the past several years, the program has produced highly popular varieties such as TAM 111, which is the most widely grown variety in Texas, and TAM 112 which touts drought tolerance, greenbug resistance, wheat streak mosaic virus tolerance, and excellent bread-making quality. Other successes include the release of TAMsoft 700, TAM 203, TAM 304, and TAM 401.

Most recently, the release of TAM 113 was announced. TAM 113 is adapted to the

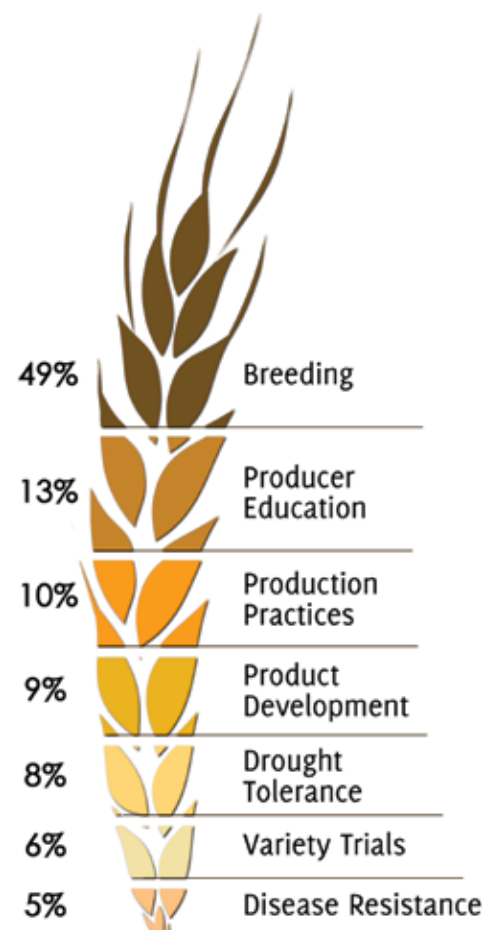
High Plains and Rolling Plains of Texas and is most similar to TAM 111. TAM 113, which will be commercially available in a couple years, will feature high grain yield potential, better leaf rust resistance and substantially better bread-making quality. In addition to TAM 113, three experimental lines are currently undergoing seed purification and increase and will be considered for variety release within two years.

End-Use Product Development

As wheat breeders continue to expand on the genetic wheat base, it is important that new higher-yielding varieties maintain their milling and baking quality. Currently, U.S.-produced wheat is globally known as the largest supply of high-quality wheat and is highly sought after by most foreign buyers. To maintain a robust domestic and foreign market, milling and baking characteristics must always be considered when developing new varieties.

Success: Researchers have developed selection methods which target poor quality varieties in the early stages of development. By determining the low quality specimens at very early stages, higher quality varieties can be promoted through the program to provide producers the highest returns without sacrificing customer satisfaction and compromising wheat markets.

2011 TWPB Research Funding by Category



All research projects are conducted by Texas AgriLife Research and Extension.

In 2008, the tortilla became a mainstream product that was for the first time more popular than sliced sandwich bread. The tortilla market is estimated to exceed \$8 billion per year in the U.S., and is steadily growing. Interest from processors in specialty wheat lines designed for tortilla production is on the rise and Texas has one of the highest concentrations of tortilla manufacturers.

Success: Approximately five advanced tortilla wheat lines have been identified that possess competitive yields and ideal quality for tortillas. Additional higher-yielding tortilla and pizza dough wheat lines will be in statewide yield trials in the coming years and targeted for release. Most recently, a predictive model has been developed to reduce costs and increase the speed of premium line identification within the program. With the development and use of these varieties Texas wheat producers will be posed to reap the first rewards from tortilla line commercialization.

Drought and Heat Tolerance

Drought stress is the single most important factor for reducing wheat grain and forage yields in Texas, particularly the High Plains. Selection of drought tolerant wheat varieties has been and will continue to be a critical strategy for wheat management under water-limited conditions.

Success: In 2010, six advanced heat and drought tolerant lines were planted with excellent results. The heat-tolerant lines developed by researchers maintain very high yields and ideal quality across testing locations and in response to heat and drought stress. Two of the identified heat-tolerant experimental lines ranked first and second in terms of yield when compared to other key varieties. Additionally, markers for high leaf wax content, which relate to heat tolerance in terms of yield and quality stability, have been identified and will be used for molecular breeding.

Currently, a lack of information exists relating to irrigation levels and their effects on wheat yields, water use and water use efficiency. To combat the issue, the TWPB approved a new project in 2011 to evaluate various controlled water regimes on new wheat varieties to identify drought-tolerant characteristics and determine how they are related to increased yields.

Wheat Variety Trials

Texas growers have to make financially crucial decisions each year, including varietal selection, which can directly impact crop success and profitability. When making these decisions, it is imperative that producers have access to accurate, verified information regarding the varieties that are available.

Success: The variety trials published by the Texas AgriLife system allow producers to evaluate the performance characteristics of various varieties throughout particular growing regions. These trials are essential in identifying varieties that perform well under drought, heat, insect and disease stress and those which will be more economically viable for producers within a particular region.

As growing conditions vary from year to year, the trials paint a picture of performance and hardiness that producers need to know to protect their bottom line. Each year the TWPB funds these trials, participates in the field days, and publishes the results in the annual Texas Wheat Seed Book to educate producers about the top performing varieties.

Disease Resistance

Wheat streak mosaic is the most frequent and economically damaging disease of wheat for many Texas producers. A large threat associated with the Wheat Curl Mite is that essentially nothing is known about wheat curl mite population dynamics. Since mite-vectoring virus disease epidemics are dependent on the wheat curl mite to disseminate the viral pathogen(s), development of an effective disease management strategy depends on developing a better understanding of the mite vector.

Success: During the first year of this two year project, six different studies were completed. Researchers developed molecular models to detect and differentiate the various mite-vectoring viruses which have significantly cut the cost and time associated with identifying each virus. Also, a single dominant gene, named Wsm2, was identified and will be used to further the development of resistant varieties.

