Breeding for performance and profit

North Dakota leads the nation in the production of 13 crops and NDSU’s 10 plant breeding programs are among the largest in the nation. Genetic improvement, as a consequence of plant breeding, is a major reason why North Dakota crop production generates more than $4 billion in on-farm cash receipts annually. The availability of diverse products through plant breeding has been essential to maintaining this large sector of the state’s economy.

An increase in wheat yield by one-half of a bushel per acre equals $28 million* increase in farm receipts annually, with a total economic impact of $84 million.

The number of NDSU regionally adaptive varieties that North Dakota producers use proves the importance of the university’s plant breeding program to the state and the region’s economy.

North Dakota friendly
NDSU varieties are especially adapted to North Dakota conditions and new releases are accepted quickly.
Example: Glenn wheat was released in 2005 and in 2008 accounted for 27.9 percent of wheat acreage (1.9 million acres). Faller, a higher-yielding wheat, was released in 2007. It was 2.2 percent of acreage in 2008 and is increasing in popularity.

NDSU Foundation SeedStocks (FSS) Project
Farmers throughout history have recognized the importance of genetically pure seed. The FSS maintains genetically pure foundation class seed of public varieties as a service to the agricultural industry. (2007-08 NDSU FSS annual report)
- Largest program in the U.S., with 15 crops and more than 100 varieties
- 5,000 acres per year dedicated to seed increase programs
- Pedigree seed program ensures genetic purity
- Clean, genetically pure seed ensures producers will have enhanced yield, quality and disease resistance of new varieties

Collaboration with industry
The NDSU FSS supports the seed and commodity industry with genetically pure foundation seed, and purity is important in barley used for malting. FSS collaborates with private and public breeding programs to make new varieties from other programs available to North Dakota producers.
Example: Tradition barley (37.4 percent of North Dakota barley acreage) was developed by Busch Agricultural Resources Inc., but foundation seed distribution is done by agreement with NDSU FSS to assure that genetically pure seed is more accessible to North Dakota producers.

In North Dakota FSS distributed varieties account for:
- 75% of wheat
- 91% of durum
- 90% of barley

Corn acres increase 425% in ten years
- Corn production has increased from 590,000 acres in 1997 to 2.55 million in 2007.
- In 2008, North Dakota produced more bushels of corn than wheat (the state’s No 1 crop).
- NDSU’s corn-breeding program is the largest in the region, using 20 locations in North Dakota.
- NDSU cooperates with more than 30 industry, USDA and public national and international partners to develop and increase genetic diversity and early maturing hybrids.
- Objectives are to adapt corn germplasm to North Dakota’s challenging conditions and develop lines and hybrids for industry use, focusing on early maturity, drought and cold tolerance, and grain quality.
- Winter nursery in South America allows three seasons per year of breeding and testing early maturing varieties, which leads to the development of lines three times faster.
  - 60% of the corn yield is due to genetics which emphasizes the importance of breeding new lines.
  - NDSU corn breeding program has developed 12 early maturing products in the past five years which were requested by over 40 private and public national and international institutions yearly.

*2008 average price $8 per bushel - 7 million acres

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