It All Starts with a Seed

Husker Genetics Vital Role in Seed Production

Can a single seed feed the world? Visualizing the accelerated pace at which the world population is growing is not an easy picture to imagine. Current world population is over 7.3 billion people. And the United Nations projects world population will reach 8.5 billion by 2030, 9.7 billion by 2050, and over 11 billion in 2100. Those are some mind boggling numbers! So, can one little, tiny seed make a difference with those types of numbers?

There is an online world population clock that provides a very good visual demonstrating how rapidly the world population is growing (www.census.gov/popclock). The numbers on the population clock provided by the United States Census Bureau almost instantaneously scroll higher and higher with the blink of an eye. The numbers swiftly race upward at a staggering pace.

If a similar clock existed tracking the availability of land used for growing food in the United States, it would only blink of an eye. In fact, in some areas, land used for agricultural crops has decreased. Yet, the United States currently leads the way in land used to produce food. We've all heard it before, but to keep pace with global food supply needs, we need to use our resources wisely and efficiently. The overriding question is will there be enough food for everyone? And that brings us back to the question - can a seed feed the world?

The University of Nebraska Institute of Agriculture and Natural Resources (IANR) has long been recognized for the important role of leading the way with innovative research, education and technology in food production. IANR's strategic plan states that while the primary emphasis will always be on Nebraska, world-class excellence will also position IANR for global leadership in enhancing worldwide food security, particularly in developing countries.

That's very tall order to fill. So it's amazing that something so incredibly small plays such a vital role in feeding the world. It all starts with a seed.

Enhanced Technology

At Christenson Building to Better Serve Clientele

Not only has technology changed the way we spend our work and leisure hours, but it recently has taken on new and improved features at program and training areas at the August N. Christenson Research and Education Building at the ARDC. Technology implementation and use aren't new concepts at the center, but rather enhancements have progressed with the changing needs and expectations of clientele.

Taking a historical look back at meetings and programs, there was a time when the “mini-theatre” (a modified area turned meeting room at the former Nebraska Ordnance Plant load line 2 structure) was where programs and training sessions were held. It wasn't fancy, but for many years served the purpose of a place to meet and learn.

Fast forward to 1995, with opening of the newly built August N. Christenson Building Research and Education Building (simply known then as the Research and Education Building), the building boasted new meeting space and a World Wide Web connection. Since that time, advances have taken place to keep pace with evolving technologies. (such as installing a 16 mile fiber optic network and Voice over IP telephony).

But in 2015, major steps were taken to upgrade and modernize the facility's technology to better serve our patrons. As using online connections and activities have become more commonplace in our lives, clientele, faculty and those teaching programs have come to expect more electronically and instantaneously. Today's tech-savvy learners expect more than a stack of plastic sheets interchanged on an overhead projector. It's not always possible to have everyone in the same room – whether it be a presenter in a different state, a student in another country, or a full-house program at the ARDC filling up the auditorium and exhibition hall at the Christenson Building. The enhanced video conferencing capabilities promotes seamless and comfortable interaction no matter where the presenter and student may be.

Two video cameras were installed in the auditorium during the upgrade, one for viewing the audience and the other for viewing the presenter. Presentations can be broadcasted worldwide and can also be recorded for later viewing. Likewise, video and audio from guest speakers from anywhere in the

More pictures and information on topics featured in this edition and from past issues are online at: ardc.unl.edu/photos.

This issue features: Husker Genetics/ Foundation Seed Division. Feature articles include:

- Beyond the Big Red Border
- It All Starts with a Seed
- Husker Genetics Staff
- No Seed Left Behind
- Producing Foundation Seed
- Promising Varieties
- The Seed Research Team
- Timeline - From Foundation Seed Division to Husker Genetics

Also in this issue:

- Enhanced Technology at Christenson Build ing to Better Serve Clientele
- Getting the Perfect Shot - Moo Manager
- Thorson - Employee of the Year
Husker Genetics - It All Starts with a Seed

The University of Nebraska has a history of providing consistent, reliable supply of well-adapted seed varieties to certified growers. The role of Husker Genetics/Foundation Seed Division has been to increase small amounts of these new seed varieties to ensure sufficient seed distribution to certified growers. The seed is further increased by certified seed growers to provide high quality seed for Nebraska farmers. These important steps bring seedstock from the plant breeder’s research plot to the farmer’s field.

The University’s research team has done an outstanding job of developing superior genotypes and has a truly impressive record of annual genetics. A clear marketing identity was needed for the release of these seed lines.

The Split Core System® was introduced in 2001 and merged with the Foundation Seed Division in 2008. Husker Genetics is now the University of Nebraska’s only division that markets and seeds technology and serves as an interface between the University and industry. It provides an outlet for the Husker germplasm wealth including the 30 years of experience and the research conducted by the Nebraska Crop Improvement Association (NHSCPA) since 1920.

As a self-supporting organization, operating funds are derived directly from sales of foundation seed services. Provided by the Nebraska Crop Improvement Association are utilization for inspection of seed fields and the expertise of agronomists, plant breeders, plant pathologists, entomologists, and extension specialists are also drawn upon.

Each cropping season, winter wheat, spring oats, soybeans, corn, sorghum, and pearl millet are raised on about 1,000 acres of land at the ARDC. A list of the various crops produced by Husker Genetics/Foundation Seed Division can be found on page 4 of this publication.

The production facility includes two cleaning lines that operate at 50 bushels per hour capacity, a free flowing chaser and a seed tender. During the winter months, staff, clean, condition, and bag seed. Husker Genetics also maintains supplies of new and established varieties offered by ARDC.

Husker Genetics seed is not sold directly to the public. The information can be obtained by contacting a certified seed dealer via the Nebraska Crop Improvement Association at 402-472-1444.

No Seed Left Behind

A few seeds are too many seeds when it comes to quality and purity control in seed production. If only it were as simple as running a combine through a field and collecting all the material. It is the ultimate “no seed”, especially in the case of open pollinated varieties. After each variety is harvested, the combines receive a thorough cleaning. Cleaning combine involves following the path the grain follows. Everything has to be cleaned from top to bottom, hopper, straw walkers, cleaning shoe, cylinder concave, clean grain tank, elevators, funnels and harvesting head. The equipment is cleaned off and vacuumed from the head to the auger and everything in between. The seed conditioning equipment is also thoroughly cleaned between varieties to ensure purity and quality.

So that the smaller the seed, the longer it takes to clean the combine because there are more turns and crossovers capabilities. A video camera system in the exhibition hall and say, for instance, viewing a farm implement and the video stream could be projected back to the auditorium or out back via the internet.

An equally important component of the advancements involves audio and sound. If you have attended an event in the exhibition hall in the past, you may have noticed that the audio quality has considerably improved for large groups. With the installation of sound-absorbing materials, the exhibition hall is now cleaned, reducing the noise level considerably.

There are now six wireless microphones and one stationary microphone of which all, one or none can be used at any given time in the different sections of the auditorium and exhibition hall. And to accommodate individuals with hearing impairments, there are several single ear clip speakers that fit easily over the ear are available.

The above photo is from the presenter’s vantage point and shows the equipment available to utilize while presenting at auditions.

Husker Genetics Staff

Husker Genetics/Foundation Seed Division (FSD) has been a part of University of Nebraska system for 92 years. Husker Genetics/FSD seeks out a broader audience for the UNL Institute of Agriculture and Natural Resources’ (IANR) research. The research is high quality genetic material for the Nebraska region, and surrounding and beyond. Husker Genetics/FSD works with release agreements from the Agricultural Research Service (ARS) and the National Plant Germplasm System (NPGS) at the USDA.

Jeff Neel is the Husker Genetics/FSD director and started in January 2003. He obtained his bachelor’s degree in ag and business administration from Western Kentucky University. Neel recently received the 2016 Distinguished Graduate Award presented by the Nebraska Crop Improvement Association for his support and marketing efforts of Nebraska developed seed varieties.

He is an agronomy technician II at the ARDC. He is a valuable resource for the university and Dakotah Farms. He also does many tasks connected to the agricultural and maintenance. He has a bachelor’s degree in agronomy from South Dakota State University.

The picture above shows the combines used for harvesting seed. Combines used range from a 1960’s E Series model to a more modern 2013 machine. All of the machines are used every year for harvesting seed crops. Enhance Technology Continued from page 1

Building the world can be a pipe dream if there is a video camera on their device and an internet connection. The technology reduces physical barriers and lends itself to streamlined real-time communications.

An important component of the modernization of the technology tools was ease of use for utilizing the equipment. For instance, the video camera system is programmed so with one push of the punch all the equipment will setup for a basic presentation (i.e., lights, microphone, projector, pre-recorded video, and screen down).

With these controls that control all of the aforementioned and more provides greater mobility for presenters to walk about the room and still have complete control over all aspects of the room and their presentations. For those who prefer a less mobile approach to presenting, the adjustable lectern features electronic height adjustment at the push of a button.

While some people still prefer to bring in their presentation on a USB flash stick, the new system easily handles laptops, cameras, DLP projectors, tablets and iPads, cell phones and many other devices. And a high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and high-definition visual presenter is available that zooms up to 128x for a microscopic view. Actual specimens, real data, and
Promising Varieties

One of the newest seed varieties to be released by the University of Nebraska and the USDA-ARS is NE10589. This hard red winter wheat cultivar was released in 2015 and has superior adaptation to re- rainfed wheat production systems throughout Nebraska and in adjacent wheat producing states. NE10589 is also known as Husker Genetics brand “Ruth”. The cultivar is named in honor of Ruth Miller. Miller was the UNL Department of Agronomy and Horticulture’s greenhouse manager for 20 years and aided in the University’s small grains breeding program. She passed away unexpectedly in May 2015.

NE10589 is a semi-dwarf wheat that has performed remarkably well in trials. Comparison trials indicate that the variety is moderately late in maturity – 147.2 days after January 1. It is resistant to susceptible to Hessian fly, moderately resistant to stem, leaf, and stripe rust and bacterial streak. This variety should be well adapted to most rainfed wheat production systems throughout Nebraska and in adjacent areas of the Great Plains.

Another newly introduced crop that is gaining attention is Liberty switchgrass. Nearly two decades of research and breeding by the USDA-ARS grass breeding program at UNL went into developing the switchgrass.

Liberty was developed for the Midwest as a biomass crop when a high rate of winter survival combined with high yields. Liberty has proven to be a high yielding biomass crop. This renewable, non-fossil energy feedstock holds great potential for conversion into a “drop-in fuel” and subsequently lessening dependence on fossil-derived fuels. Liberty can be grown on and protects marginal lands while providing a potential revenue source.

Husker Genetics first made Liberty switchgrass seed available to certified seed growers in spring 2016, so Liberty will be available to farmers in fall 2016 through certified seed dealers. Contact the Nebraska Crop Improvement Association at (402)472-1444 or www.neccrop.org to locate a dealer.

Producing Foundation Seed

Husker Genetics/Foundation Seed Division is an auxiliary business unit to the University of Nebraska-Lincoln. Its function is to support the research and development of new cultivars in multiple species. The seed production facility is located at the ARDC. Seeds that Husker Genetics/Foundation Seed Division deals with include:

- Barley (Winter)
- Chickpeas / Garbanzo Beans
- Dry Edible Beans (Great Northern, Pinto, Light Red Kidney, Navy, Small Red, and Black)
- Field Peas (Yellow)
- Millet (Proso, Foxtail, and Pearl)
- Oats (Spring)
- Perennial Forage Grasses (Big Bluestem, Sand Bluestem, Bromegrass, Side Oats Grama, Indian Grass, Switchgrass, Intermediate Wheatgrass)
- Sorghum (Grain, Forage, and Biomass)
- Soybeans (Roundup Ready, Convention- al and Food Grade)
- Triticale (Winter, Grain, and Forage)
- Wheat (Clearfield, Hard Red Winter, and Hard White Winter)

Husker Genetics/Foundation Seed Division has been producing quality seed products since 1949 – the essential link between the plant breeder and growers. While much has changed over the years, the goal of producing quality seed has remained constant.

An example of how production equipment has changed over the years is the on-demand seed treating system now utilized by Husker Genetics/FSD. The equipment is fully automated - staff do not have to mix or handle chemicals and seed treatment is very precise.

Triticale forage research is being conducted in this New York plot. Results from tonnage yields and cropping systems are being analyzed.

Getting the Perfect Shot

From time to time, the research center is utilized as a backdrop for photos of various University of Nebraska-related projects and programs. One such photo shoot involved University of Nebraska at Omaha graduate, Rachel Ostrender, who developed the Moor Manager app and received the Peter Kiewit Student Entrepreneurial Award for her work while attending UNO. Ostrender is shown demonstrating her app in the top photo. Looking at the photo, you might not realize what was going on from the other side of the camera. The photographer (bottom photo) piqued the cattle’s curiosity. Photos provided by Stephanie Pistillo.