

Testimony on Ag Research and Education Priorities  
State Board of Research and Education  
November 15, 2019

Good Morning Chairman Birdsall and State Board for Agricultural Research and Education members. I am Nancy Johnson and serve as the Executive Director for the North Dakota Soybean Growers Association, representing soybean growers in North Dakota. We appreciate this opportunity to come before you and outline some of our Association's agricultural research and extension priorities for your consideration.

The NDSGA and our sister agency, the North Dakota Soybean Council, have enjoyed an excellent partnership with SBARE and NDSU Research and Extension. We look forward to working with you to help make your SBARE priorities a reality for the benefit of all of North Dakota's agricultural community.

Before we begin, thank you for your collaborative contributions to past SBARE successes. The following are priorities that our Association would like you to incorporate into the coming biennium's funding request. We'd also like to thank you for your support on the improvements for the NDSU website. We use the site frequently and value the content.

**Soil and water** constitute the core elements of our food, feed and fiber.

**Water Quality Specialists and Operational Support** - As we move every closer to nutrient management plans, even if they are voluntary, it is critical to understand the science of our finite resource. This includes effective care, efficient use, effective preservation and restoration of the surface and subsurface water resources. Increasing opportunities for understanding water and nutrient management best practices is what we seek in our request.

Topics range from water quality for human and livestock consumption; emerging nutrient management requirements and practices; quality water delivery to needed locations; best practices for economic development in our agricultural, manufacturing and urban settings.

The direct transmission of accurate information on the science of water through educational programing is critical for decision-making by individual citizens, as well as our community and state leaders.

**Precision Agriculture Research, Teaching and Extension staff** - It feels like precision agriculture has been practiced in North Dakota for a long time, just to a greater degree for some crops. While there has been a focus on planter accuracy, there is a gap related to the most effective application of weed control products. With products sensitive to temperature inversions, for instance, there is practical applied research needed to make these products the most effective.

Tech savvy farmers are employing precision farming techniques to better manage their cropping operations. Technology adoption rates are rising and technology lifespans are decreasing. Newer technologies need exploration and adoption to expand potentials of sensors, sensor vehicles, robotics and computing processes to maintain and grow our competitiveness in global markets.

**Soybean Storage Research Technician** - During the past 20 years, the soybean industry has grown from just over a million acres to a peak of over seven million acres with a farm gate value that exceeds \$2 billion. For much of that time, it was financially advantageous to market the soybeans in the fall, essentially hauling them to the local elevator right off the field. The soybeans typically dried down in the

field to a good handling moisture so if they did end up in a bin, they would retain top quality during the winter. Most beans were shipped off the farm by the end of February.

Last fall, we received numerous calls about handling wet beans when the temperatures dropped, and drying beans became very costly. While we received excellent support from NDSU, the information they provided was based on extrapolating data from other states. We hoped this was a one-time challenge.

Apparently not. Harvest was delayed by the wettest September on record, and a snowstorm in October. The fields are wet. The plants are wet. The soybeans are wet. The prices have been inching up, but we understand that a significant amount of the harvest may end up in on-farm storage again.

We hope to harvest the last quarter of the soybean crop very soon. However, the market to sell right off the combine has diminished and the wet weather has meant combining 13% moisture soybeans is a distant memory.

So, it seems like the time has come to fund a technician to support the research efforts related to effectively storing soybeans.

**Center for Excellence – Farm Ownership, Transition and Intensive Management** - Farmers in the United States are 57.5 years of age, on average. The median age for Americans is 38.2. In North Dakota, the average age of farmers is slightly lower at 56.3 years and the median age is 35.4 years. According to the 2017 ag census, nearly one-third of the principle farm operators in North Dakota are 65 years of age or older.

I've observed that many farmers don't exactly "retire." My grandfather drove tractors well into his eighties and really appreciated creature comforts like a cab and comfortable seats. He was also comfortable that a transition plan was in place so the operation could continue on smoothly when he passed.

My father was actively working on the farm when he was killed in a farm accident at 79. Because the same transition plan was in place, the operation continued smoothly to my brother's leadership. This plan was developed when I was a teenager and there were no surprises for anyone involved while we were dealing with my father's sudden death in the middle of the season.

Unfortunately, transition planning is a difficult topic for many farmers. Recently, I had a painful conversation with a former board member who said his family had spent two years with a financially focused planner and they still hadn't sorted out how the operation was going to move forward. The planning was triggered by his grandmother's and his father's desire to retire. Clearly, transition planning isn't just a financial discussion involving millions of dollars.

Currently, there is no center focused on this important area at any university. There are no case studies about the transition process which address the dynamics of the family and farm ownership. With research into best practices for transitions, or revisions of transition plans when the assumptions change dramatically, farm families could look at outside guidance during a stressful time.

Such a center could evolve into an institute which would tackle emerging issues, provide workshops for farmers and yearly conferences on specific areas. We would ask to fund a director position.

**Center for Agricultural Policy and Trade Studies (CAPTS)** – Trade, how many bushels of soybeans worth how much went where, has become the focus of our world. We in the soybean world have funded

international market development programs for the past 35 years. The crop has provided an excellent economic opportunity for many North Dakota farmers.

This produced an economic contribution crossed the \$2 billion mark several years ago, but due to the nature of exporting bulk commodities like soybeans, this impact was not clear. The lack of clarity became evident as trade talks heated up last year and members of Congress called for information. How will North Dakota be impacted if soybeans aren't shipped to China?

It turned out that the Census data used to measure the dollar volume of exports pointed to extensive soybean exports from Washington state and Oregon, where no soybeans are grown, but little or no soybean exports from North Dakota, where hundreds of millions of bushels are grown, but few are used. While there is reliable data which tracks commodity movements out of North Dakota via rail and trucks which indicated extensive soybean shipments to the Pacific Northwest, the dots were a little tricky to connect.

So, how do you do farm policy when you have sketchy information? How do you build models that predict the outcome of policy when there is conflict between data sets? How can decisions be made to diversify the economy, minimize risk and stabilize revenue without this kind of information? With the addition of a technician and a grad student, the capabilities of CAPTS would be expanded so that we can help plan for the next big thing in agriculture.

**Adapting to Climate Extremes** – Recently, Daryl Ritchison, director of the North Dakota Agricultural Weather Network, presented an overview of weather extremes in the state to a water-focused meeting. The extremes of moisture, like the all-time high rainfall in September, and drought, produce challenges for farmers in the state. While we are not recommending a specific solution at this time, we would suggest that the extremes are considered during the work of the research and extension network.

**Endowed Chairs** – Many departments have longtime, dedicated personnel. Unfortunately, many could retire at any time and this could leave gaps due to some inability to compete in the talent market. We have proposed endowing chairs with Legacy fund earnings as a long-term investment in North Dakota. That testimony is provided for your consideration.

**Waldron Hall Replacement** – (Capital Project) This facility was initially designed and built in the 1950s with an addition in the 1960s and is used as laboratory space for plant-based research programs.

When built, there were less than a dozen field related programs involving plant-based research; today, there are more than 13 breeding programs, as many pathology programs, and several soils programs that occupy the space. It is poorly designed for 21st Century agricultural sciences, and the numerous program requirements make it very cramped, resulting in inefficiencies and frustrated researchers. There is no adequate long-term seed storage space for breeding and pathology programs – close proximity of field labs to short, mid, and long-term seed storage is critical for efficiency. Effective seed drying and cleaning facilities providing for worker safety and improved efficiencies is critical.

Waldron Hall simply does not have the capability or capacity to meet the day-to-day needs of complex laboratory research necessary in today's competitive environment and most importantly, the our state's needs in a food security or crop disease crisis.

Departments and offices located in, or utilizing laboratory space, in Waldron Hall include:

*ND Agricultural Weather Network (NDAWN Center)*

The North Dakota Agricultural Weather Network, known as NDAWN, is celebrating its 30th year of providing weather data to enhance crop management in North Dakota.

Originally designed specifically for agriculture, the network's 131 stations have proven useful in other areas as well. In a state with extreme weather conditions, access to detailed local weather data can be a valuable resource for everyone.

The network provides weather data that is used in developing various agricultural models such as late blight, degree-day and growth stage for barley, corn, canola, potatoes, sugar beets, sunflowers, wheat and other small grains. NDAWN users also can monitor irrigation scheduling, crop water use and conditions for detrimental insect development.

### *Plant Diagnostic Lab*

For over 40 years, the NDSU Plant Diagnostic Lab has provided unbiased assistance to the general public and professionals in agriculture and horticulture to identify plant pest and disease problems. The lab has been a member of the Great Plains Diagnostic Network, a region of the National Plant Diagnostic Network, since 2002. A goal of this network is to enhance our ability to detect and diagnose high-risk plant problems more quickly.

Local university plant pest diagnostic labs can provide assistance in solving plant problems. Local experts are often better equipped to address particular questions in our area, since crops, lawns, and other plants and trees around the country experience different problems.

Modest service fees apply on submitted samples for routine diagnosis to the NDSU Plant Diagnostic Lab, and a surcharge is applied to out-of-state samples. The NDSU Plant Diagnostic Lab also independently performs limited seed health testing.

### *Soil Science*

Soil Science is the key factor in food production and is at the forefront of environmental and natural resource issues such as land use, soil contamination, ground water quality and waste disposal.

The Soil Science Department is home to a robust array of sub-disciplines researching every aspect of the soil, including:

Environmental Quality	Soil Fertility
Soil Physics and Hydrology	Soil Management
Agricultural Meteorology and Climatology	Soil Chemistry
Soil Genesis, Morphology, and Classification	Soil Health

Our Soil Science disciplines demand a 21st Century laboratory facility to accommodate successful research facilitating the needed care and maintenance of our soils as we pass them to successive generations.

### *Plant Pathology*

Plant Pathology finds itself similarly situated. Its bachelors, masters and doctorate programs all ache for a 21st Century laboratory facility to accommodate successful analysis of current diseases, while looking to future prevention opportunities.

The faculty has expertise in host-parasite genetics, microbiological ecology, epidemiology, tissue culture, molecular biology, genetic resistance, nematology, bacteriology, mycology, virology and electron microscopy. The Plant Pathology Department faculty has been successful in developing management practices and controls for major diseases.

The research emphasis within the department is placed on small grains, potatoes, oilseeds, beans and prairie forestry. Research projects cover root rots, head blights, foliar diseases, stem rust, leaf rust and

viruses of cereals as well as diseases of canola, dry edible beans, flax, potatoes, soybeans, sugar beets, sunflowers, urban forestry and shelterbelts.

NDSU plant pathologists constantly seek to improve control programs to meet market demands, address environmental concerns and apply emerging technologies. With plant breeders, pathologists find disease resistant genetic materials from domesticated and wild varieties worldwide. New biotechnology techniques enable incorporation of genetic resistance into crop varieties. Pathologists seek safer and more effective pesticide use, including biological controls, for crop protection until adequate genetic resistance is available. They also examine cultural practices to reduce disease threats.

The Forest Pathology conducts one of the only US University research programs in prairie forest pathology; monitoring tree and shrub diseases and developing integrated disease management practices.

Seed Health Testing Laboratory identifies seed borne pathogens.

Extension plant pathologists have major outreach programs. They help growers apply research results controlling plant diseases.

### **Weed Resistance Research and Outreach**

Our position is that effective weed resistance solutions are a mix complex issues ranging from research, human understanding and behavioral modification opportunities, and perhaps public policy adaptation. We are also concerned about the trade implications of weed seed in exported soybeans. This has become a non-tariff barrier in some counties and a point of negotiation in others.

Weed resistance is an expensive and growing threat to farmers and ranchers today for which there does not seem to be any silver bullets. Resistance, rooted in a plant's natural ability to adapt in the presence of threats, is a long-term issue.

Effective plant pathology and/or other advanced research field practices may ultimately provide simpler answers for agriculture and others. New or changes in known chemical, biological and cultural practices are also potential solution ingredients. However, we believe the most promising advances available involve human behavioral change in producers understanding, their solution related role acceptance and responses to their particular issues. It is critical for producers to understand and accept that the weed resistance challenge is a long-term battle.

Effective eradication requires correct identification of the offending weeds, timely and correct application elimination processes and continual follow-up to ensure success. There are an abundance of identification and elimination practice guides available, but we are convinced that producer ability to effectively identify and treat threats is not available in abundance.

We understand the difficulty of increasing producer capabilities, but we must find a way to crack the code on this critical issue. We believe producers will need solid educational opportunities beyond what is currently available. They must be provided scenarios of the longer-term importance to their economic future to fight these battles effectively . . . and win!

Unfortunately, we do not have specific solutions to offer. But we know our agricultural community must start the conversation and quickly turn those conversations into effective strategies and activities. A suggested starting point maybe a Weed Resistant Summit to bring producers, producer educators and researchers together to present current information and explore strategy and activity options.

**Additional programs** – The North Dakota Soybean Council will provide additional testimony on water quality, resistant weeds, specific needs at RECs and the economic issues farmers face. We support those initiatives.

### **Success Pathways**

In conclusion, providing farmers and ranchers with pathways to success is your and our success. Dividends are dependent on investments. Agricultural research success is rooted in people, facility and equipment investments. Peoples' talents, skills and creativity are among the most important ingredients of our futures.

We ask that you fully consider our priorities and stand beside you supporting SBARE's final priority determinations.

Thank you for your time and attention.



North Dakota Soybean Growers Association  
4852 Rocking Horse Circle South, Fargo, ND 58104  
(701) 566-9300 | [www.ndsoygrowers.com](http://www.ndsoygrowers.com)

## Testimony on the Use of the Legacy Fund Earnings November 12, 2019

Good Evening Chairman Pollert and the Legacy Fund Earnings Committee members. I am Nancy Johnson and I serve as the Executive Director for the North Dakota Soybean Growers Association, representing soybean growers in North Dakota. We appreciate this opportunity to come before you and outline our idea for an earnings investment.

Before I suggest a way to spend Legacy Fund earnings, I'd like to start by talking about our sister agency, the North Dakota Soybean Council, and the investments that the Council has made in research at NDSU during just the past 10 years. Since 2010, the Council has funded \$14,017,432 in research. During that time, the Council also contributed \$750,000 toward the new greenhouse. And finally, the Council has pledged \$500,000 for the Ag Products Utilization Center. I think we can categorize this support as an effective public private partnership.

That funding has come from the soybean checkoff, a small assessment collected from the grower when the crop is first sold, which was enacted in 1985. At that time, there were only 485,000 acres of soybeans harvested in North Dakota. Those soybeans had an estimated value of \$61 million at the farm gate. Wheat harvested was worth over \$1 billion that year.

During the next 13 years, wheat remained the top acreage crop and dollar value at the farm gate. Then things changed. Technology was introduced. Seed varieties, equipment, herbicides. Technology that hadn't been used by growers across most of this state in North Dakota growing conditions. Even with that challenge, soybeans have grown to be worth about \$2 billion per year at the farm gate, passing all economic activity categories in North Dakota but oil production. I've included a chart to demonstrate that point.

Last week, I drove from Fargo to Bismarck to Minot to Grand Forks and back to Fargo. It was a great day for harvesting and I saw soybean growers combining everywhere on my drive. I drove through two of the top soybean-producing counties in the United States: Cass and Stutsman counties were only topped by a county in Illinois for soybean production in 2018.

So how did this dramatic increase in soybean acres happen? Research. Research that helped determine the best planting dates, row widths and plant populations, that confirmed when to apply herbicides, at what moisture to harvest the crop, at what moisture to store the crop. Research to determine the best time to treat for diseases like white mold. To determine the number of insects per plant that made spraying the most effective financially. To determine areas where new pest threats need to be monitored. To help create the best cropping plan for the best economic outcome for North Dakota farms.

How did that research happen? As I noted early, the Soybean Council has invested and continues to invest checkoff funds in production research at NDSU, in many departments with a wide range of expertise. So, after that setup, what am I asking for?

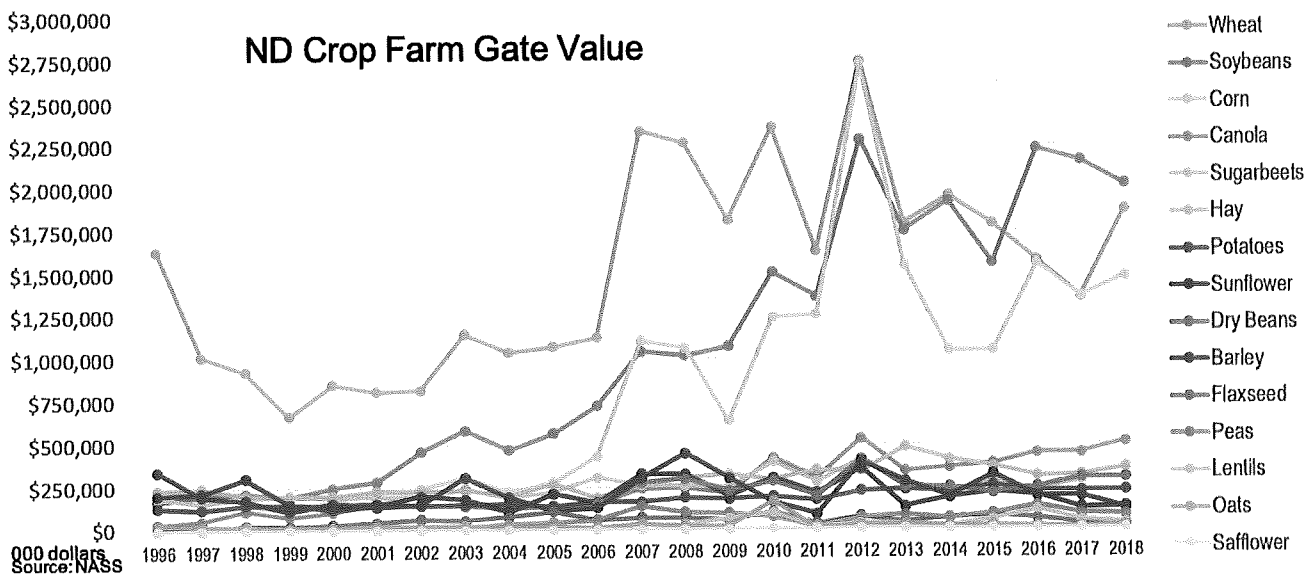
Well, we recently hosted agriculture area department heads at NDSU in our office. The purpose of the meeting is to get the view across the university of issues and concerns related to agriculture. After the discussion, a pattern emerged. Each department represented has very experienced researchers and up to a third of them are eligible for retirement today. Many are so dedicated that they continue to serve agriculture well beyond their opportunity to retire. And what happens when they do retire? That's the challenge.

According to our colleagues at NDSU, the university is very competitive when recruiting an entry level assistant professor. That assistant professor grows and develops, learns about our crop and others, for several years. They become very valuable. Then, just as they would move into an associate professor position, they are often hired away by other universities who have more competitive employment packages. Or an endowed chair.

So, that's our request: 10 endowed chairs for researchers at NDSU and at UND. Depending on the position, current endowments have ranged from \$4 million to \$7 million. We recommend using Legacy Fund earnings to fund endowed chairs.

In conclusion, agriculture continues to be one of North Dakota's economic engines. Dividends are dependent on investments. Agricultural research success is rooted in people, facility and equipment investments. Peoples' talents, skills and creativity are among the most important ingredients of our futures.

Thank you for your time and attention.

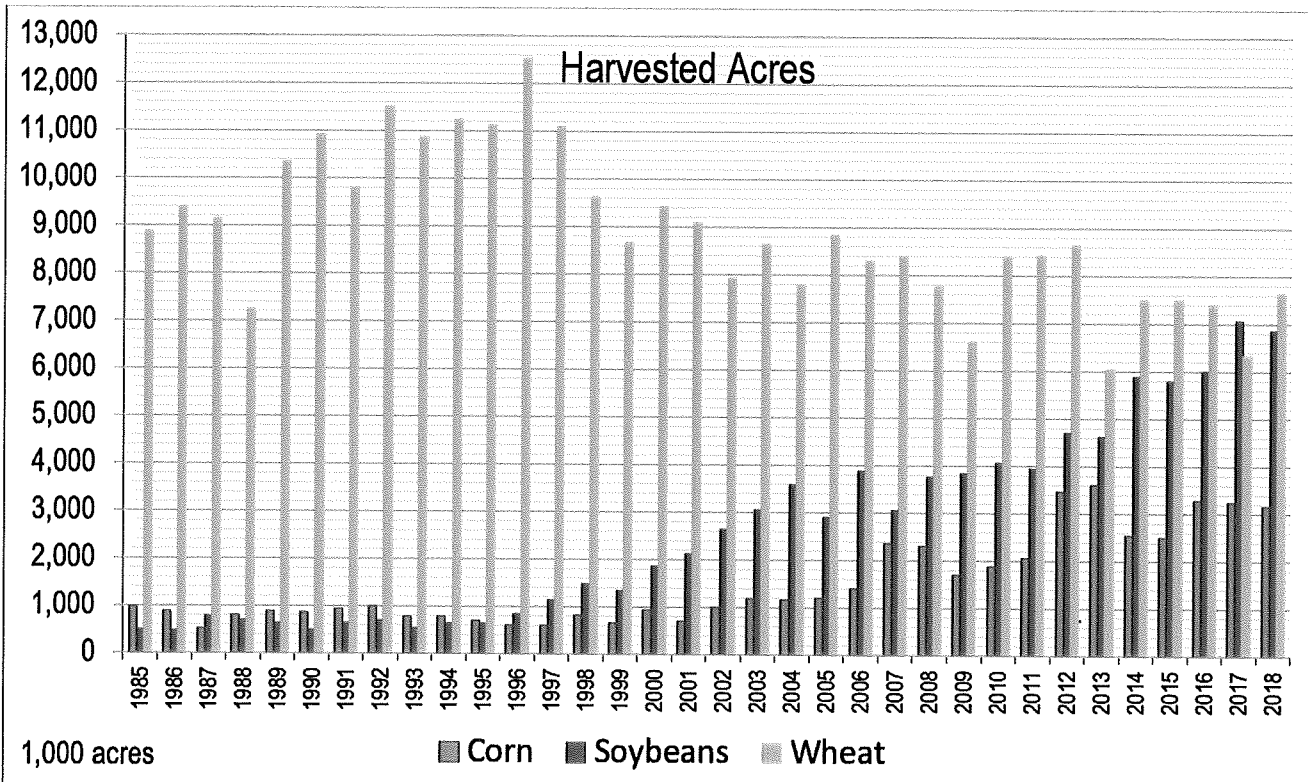
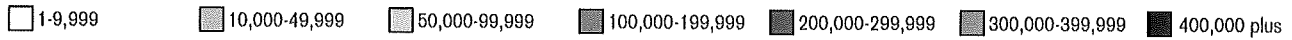
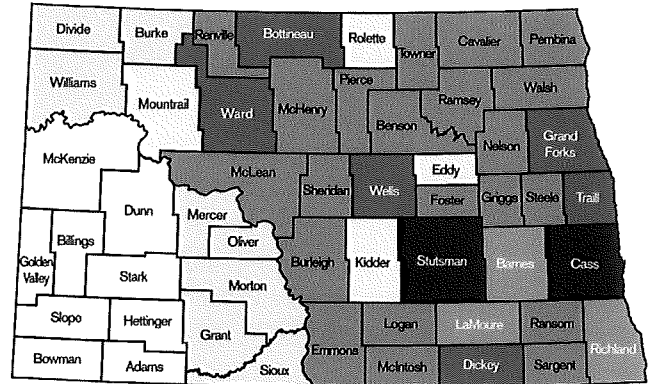
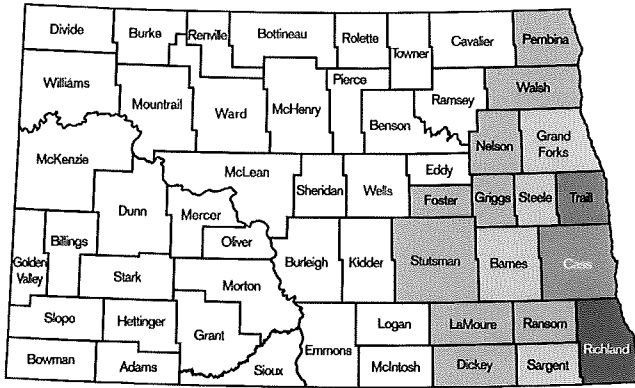




## North Dakota Soybean Production (Acres)

**1998**

**2018**



**11.12.19**

	<b>Commodity</b>	<b>Futures</b>	<b>Basis</b>	<b>Cash Price</b>	<b>Delivery Month</b>
Casselton	Soybeans	917-0	-100	\$8.17	Nov '19
Casselton	Soybeans	917-0	-100	\$8.17	Dec '19
Casselton	Soybeans	917-0	-105	\$8.12	Jan '20
Casselton	Soybeans	930-2	-115	\$8.15	Feb '20
Casselton	Soybeans	930-2	-115	\$8.15	Mar '20
Casselton	Soybeans	942-6	-120	\$8.23	May '20
Casselton	Soybeans	953-6	-125	\$8.29	Jul '20
Casselton	Soybeans	957-2	-135	\$8.22	New Crop '20

