



# WORLD BREWING CONGRESS 2016

## NO BARLEY – NO BEER

(Steven Edwardson, North Dakota Barley Council)

World Brewing Congress  
August 13-17, 2016  
Sheraton Downtown Denver  
Denver, CO 80202, U.S.A.

### No Barley – No Beer

Why the U. S. Needs to Support Growers to Keep Raising Malting Barley.

Steven Edwardson  
Executive Administrator  
North Dakota Barley Council  
West Fargo, North Dakota



World Brewing Congress  
August 14 – 17, 2016  
Denver, CO

### Presentation Overview

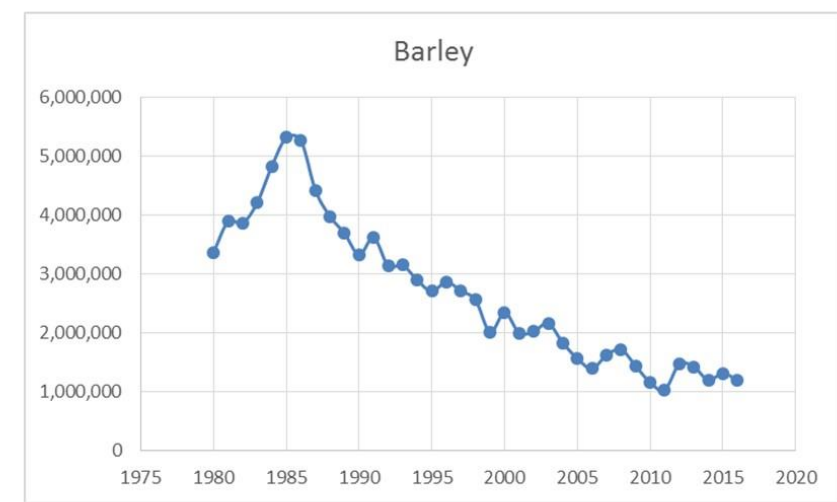
- REVIEW TRENDS IMPACTING U. S. BARLEY PRODUCTION.
- OUTLINE FACTORS GROWERS UTILIZE IN CROP ENTERPRISE SELECTION.
- IDENTIFY AND QUANTIFY RISKS OF MALTING BARLEY IN COMPARISON WITH COMPETING CROPS.
- OUTLINE THE SHIFT FROM PURCHASING MALTING BARLEY AS A COMMODITY TO PROCURING MALTING BARLEY AS AN INGREDIENT.
- SUMMARIZE THE OUTLOOK FOR U. S. MALTING BARLEY PRODUCTION.

### U. S. Barley Trends

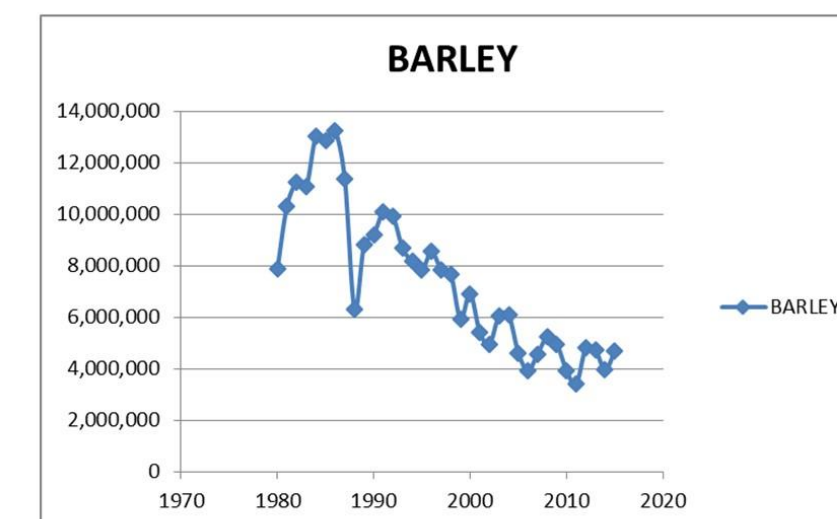
- Planting
  - 1985: approximately 5.3 million hectares.
  - 2016: approximately 1.2 million hectares.
- Production:
  - 1985: approximately 13 million metric tons.
  - 2015: approximately 5 million metric tons.

### Barley Planting Trends

Area planted to barley (hectares) in the U. S. from 1980 through 2016. Data Source: USDA National Ag Statistics Service.



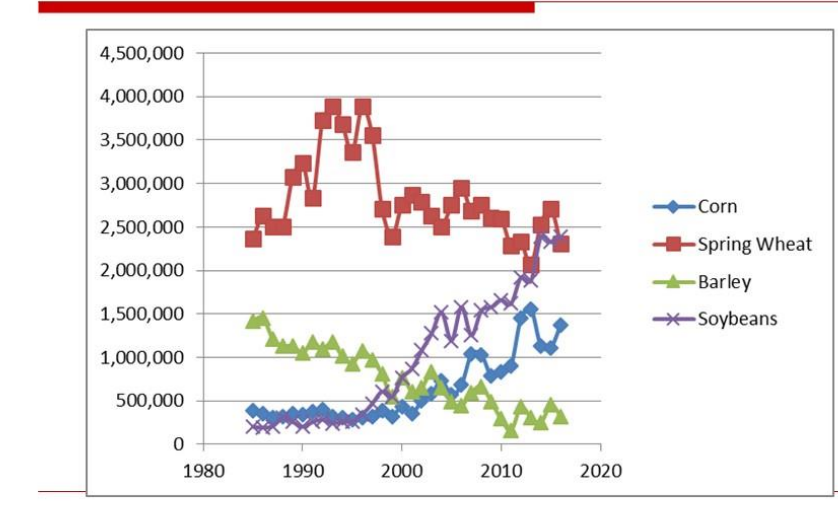
### U. S. Barley Production (metric tons), 1980 – 2015. USDA National Ag. Statistics Service.



### The Shift to Corn and Soybeans

U. S. farmers shifted their crop production systems from wheat and barley to more corn and soybeans. New production regions in the northern plains (e. g. North Dakota) provided farmers with new crop enterprise opportunities in corn and soybeans. Easier production, less storage time, market risk management tools, faster inventory turning rates, and prompt payment on delivery impacted the shift from malting barley to corn and soybeans. This is further evidenced in the following chart for North Dakota.

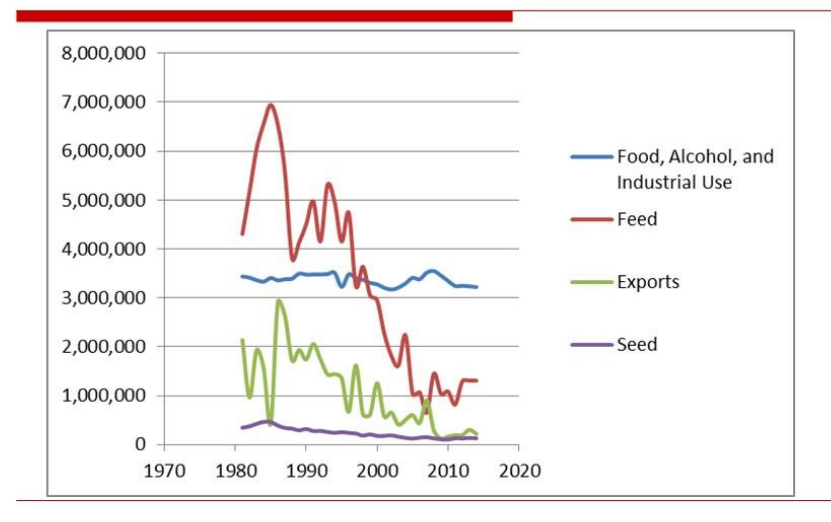
### Area Planted (hectares) to Selected Crops in North Dakota from 1985 – 2016. Data Source: USDA-NASS



### Understanding the Barley Utilization Shift

- The following chart assists in understanding the shift in barley utilization.
- Barley utilization in livestock feed (the red line) declined from a peak of 7 million metric tons in 1980 to approximately 1.3 million metric tons in 2014.
- Barley exports (the green line) were largely for livestock feed. Less barley used in feed in the U. S. translated to less supplies for the export market.
- The blue line is largely production utilized in malting and brewing. Efficiencies in malting and brewing have assisted in generally consistent use of approximately 3.5 million metric tons per year.
- A brief surge in feed barley exports to Japan in 2007 and 2008 largely forced the malting and brewing industry to develop a new procurement strategy for malting barley.

### Trends in Barley Utilization and Distribution in the U. S. Metric Tons – USDA-ERS Feed Grains Database 1981 – 2014



### How Growers Decide Which Crops to Plant

- Crop production is very similar to other manufacturing processes. There are two key components in any manufacturing business.
  - Turning inventory.
  - Generating cash flow.
- Growers have chosen to produce less malting barley for the following reasons:
  - There are many other choices of crops to plant.
  - The risk of not achieving the malting barley price is too great.
  - Corn and soybeans are easier to store, market, and sell.
  - Corn and soybeans offer less downside risk and greater upside profit potential.
  - Lending institutions consider barley to be too risky.

### Selecting a Crop Enterprise

- The North Dakota Barley Council utilized a grower focus group to outline crop selection decision factors.
- Two general categories in crop selection were identified.
  - Crop quality factors.
  - Crop business management factors.
- Growers identified specific factors in each category for malting barley, corn, soybeans, and spring wheat.
- Factors were scored (1=easy, 2=more difficult, 3 = very difficult) to generate a color coded heat map.

### Crop Quality Factors

- Corn and soybeans.
  - Test weight (bulk density) and moisture content.
- Malting barley.
  - Bulk density, germination, mycotoxins, plump kernels, protein, heat damage, frost damage, sprout damage, moisture.
  - Malting barley is the only crop that must be delivered in a "living state".

### Crop Business Management Factors

- Profitability.
- Storage. Length of time crop is stored on the farm, requirements for maintaining integrity of the stored crop, and storage costs.
- Price transparency. Malting barley does not have a futures market, thus making price discovery more challenging.
- Availability of crop insurance for risk management.
- Impact on cash flow (e. g. timeliness of sales and payments).
- Banker support. Some bankers consider malting barley to be too risky.
- Crop management intensity. Barley fields must be continuously monitored for weed control, disease control, harvest timing, etc. Stored barley also needs to be monitored.

### Heat Map – Quality Factors

FACTORS	HARD RED	MALTING BARLEY	CORN	SOYBEANS
<b>Crop Quality Factors</b>				
-Falling Numbers	1	1	1	1
-Test weight (bulk density)	1	1	1	1
-Protein	1	2	1	1
-Moisture	1	2	1	1
-Germination	1	2	1	1
-Mold in seed crease	1	2	1	1
-Deoxynivalenol (DON)	2	2	1	1
-Heat damage	1	2	1	1
-Frost damage	1	2	1	1
-Sprout damage	1	2	1	1
-Color	1	2	1	1
-Plump Kernels	1	2	1	1
TOTAL SCORE FOR QUALITY:	13	23	12	12

### Heat Map: Business Management

Crop Business Management Factors	HARD RED	MALTING BARLEY	CORN	SOYBEANS
-Gross margin	1	1	1	1
-Storage on farm	1	2	1	1
-Storage payments for on farm	1	2	1	1
-Price transparency	1	2	1	1
-Receipt of payment	1	3	1	1
-Banker support	1	2	1	1
-Crop insurance coverage	1	1	1	1
-Crop management intensity	1	1	1	1
TOTAL SCORE FOR BUSINESS FACTORS:	8	20	8	8
TOTAL SCORE:	21	43	20	20

### Grower Focus Group Results

- Malting barley requires more management time and skill.
- Corn and soybeans are much easier to produce and sell, and are nearly "idiot proof".
- The risk of malting barley production must be quantified to help buyers understand and compare risks between malting barley, corn, soybeans, and wheat.

### What is Downside Risk? Here is an Example

- Malting Barley Yield: 100 bushels per acre.
- Malt Barley Price: \$5.00 per bushel
- Feed Barley Price: \$3.00 per bushel
- Gross Revenue Comparison
  - 100 bu/ac x \$5.00/bu = \$500.00 per acre.
  - 100 bu/ac x \$3.00/bu = \$300.00 per acre.
  - Difference between malt and feed: \$200.00 per acre.
- Downside risk is the probability of not achieving malt and thus selling at a price that cannot provide sufficient profitability (and likely will result in a loss).
  - Can the grower afford to risk \$200.00 per acre?
    - On 1000 acres, this is \$200,000.00.

### Modeling Comparative Risk

- The North Dakota Barley Council funded a project at North Dakota State University (NDSU) to quantify and compare the risk of producing malting barley in comparison with spring wheat, corn, and soybeans.
- The objective was to measure the variability in return to labor and management for these crops.
  - (Yield x Price) = Variable Costs = Return to Labor and Management (RLM).
  - Variable costs include seed, fertilizer, weed control, disease control, and machinery costs.
  - Yield, price, crop quality, and crop insurance were included.
- This level of comparison allows one to move from a static crop budget to a dynamic crop budget.

### Materials and Methods

- The project was conducted in 2013 and utilized crop enterprise budgets developed at NDSU, which focused on two regions in North Dakota.
  - The north central region, where malting barley competes with corn, soybeans, and wheat, but corn is more difficult to produce.
  - The central region, where corn and soybeans have largely displaced malting barley and other crops.

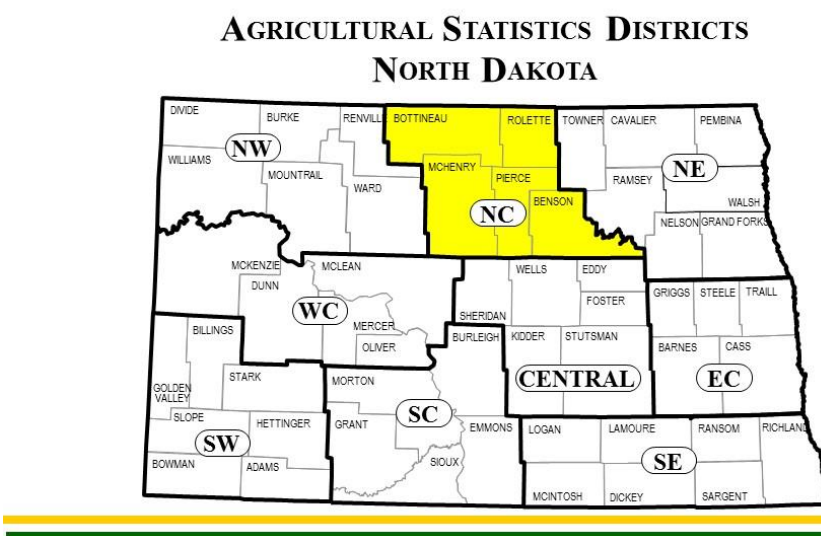
### Materials and Methods

- Crop budget data was summarized in an Excel worksheet.
- @Risk (an add-on program that works in Excel) was utilized to calculate all possible combinations of return to labor and management, thus quantifying the entire range of profit and loss potential.

### YIELD, PRICE, AND QUALITY COMPONENTS OF COMPARATIVE RISK STUDY

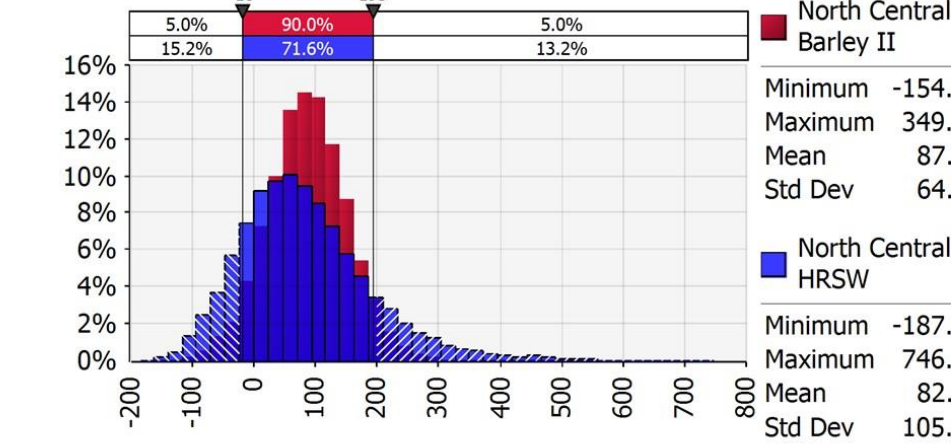
Crop	Yield	Price	Quality	Crop Ins.
Malt Barley	63.5	6.10 c 5.60 m	70% acceptance	75% Revenue Coverage
Spring Wheat	43.5	7.75	Protein Spreads	75% Revenue Coverage
Corn	98.5	5.50	T.W. Drying	75% Revenue Coverage
Soybean	30.5	12.20	None	75% Revenue Coverage
Canola	1580	23.70	None	75% Revenue Coverage

### REGION: NORTH CENTRAL NORTH DAKOTA. MALTING BARLEY AND SPRING WHEAT UNDER PRESSURE FROM SOYBEANS AND CORN



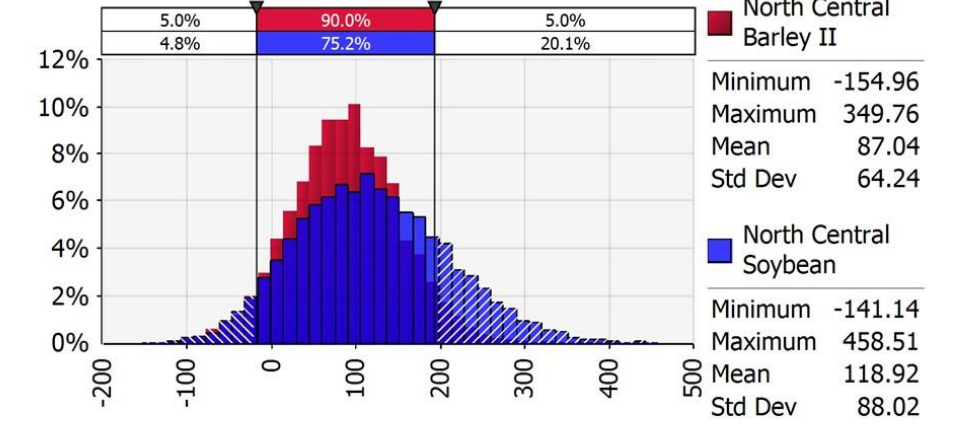
Source: N. D. Agricultural Statistics

### North Central Barley vs Spring Wheat



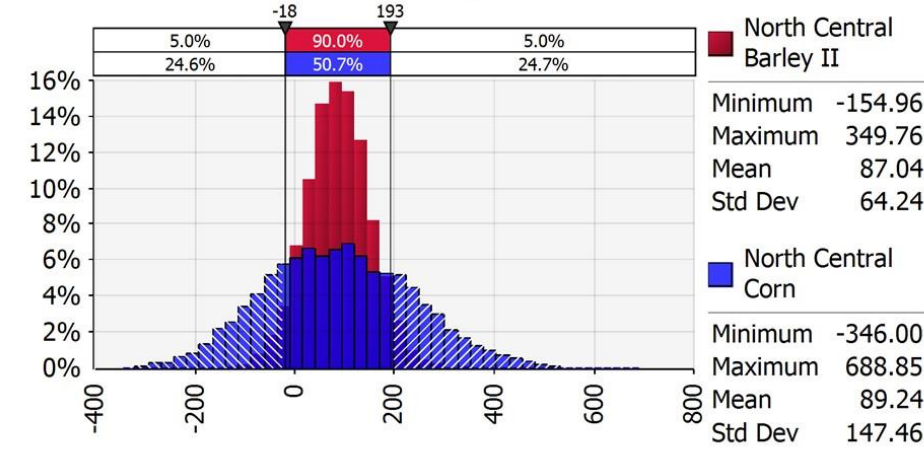
Malting barley has a higher mean and a lower standard deviation than spring wheat. However, spring wheat has higher upside profit potential (maximum of \$746.41 per acre vs \$349.76 per acre for barley).

### North Central Barley vs Soybean



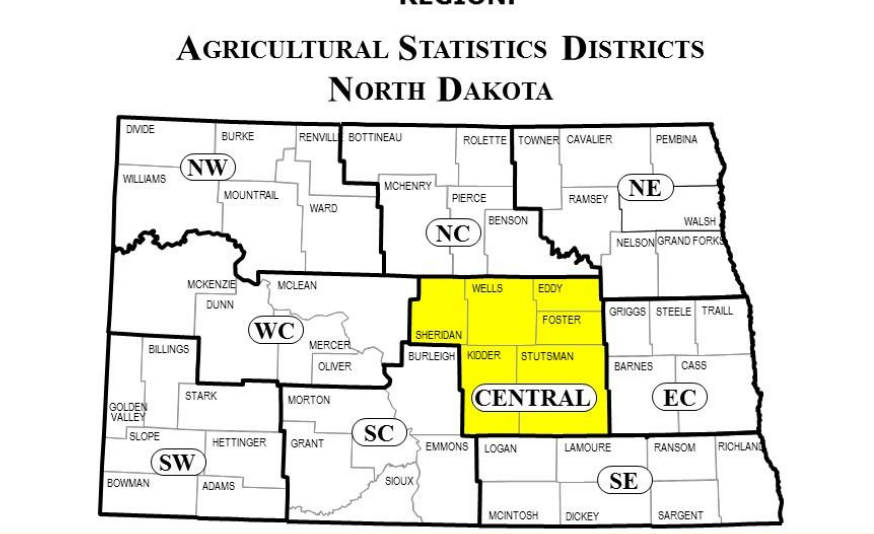
Malting barley has a lower mean than soybeans. Soybeans have a higher maximum profit potential (\$458.51 per acre compared with \$349.76 per acre for malting barley), and also have lower potential for loss (-\$141.14 per acre compared to -\$154.96 per acre for malting barley).

### North Central Barley vs Corn



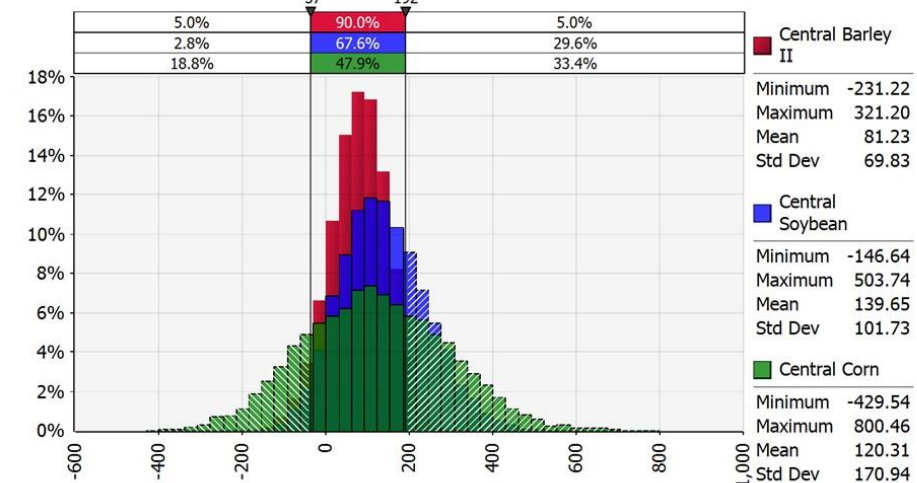
The average return per acre for malting barley and corn was very similar (\$87.04 vs. \$89.24). Corn had higher variability in profit, with a larger maximum profit potential (\$688.85 vs. \$349.76).

### REGION: CENTRAL NORTH DAKOTA. CORN AND SOYBEANS HAVE DISPLACED WHEAT AND BARLEY IN MUCH OF THIS REGION.



Source: N. D. Agricultural Statistics

### Central Barley vs Soybean vs Corn



Corn and soybeans had higher average returns than malting barley (\$120.31 for corn, \$139.65 for soybeans, and \$81.23 for malting barley). Soybeans had less downside risk than malting barley, and are easier to produce and sell.

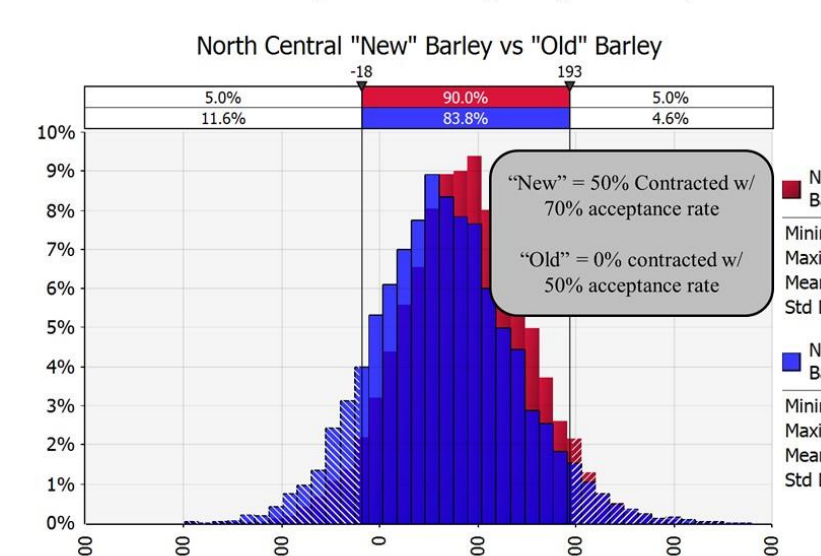
### OVERALL PROJECT RESULTS

- The relative risks of producing malting barley, spring wheat, corn, and soybeans, can be quantified and compared.
- Malting barley contracting programs implemented by the industry have helped stabilize production.
- Malting barley must be procured as an ingredient, not traded as a commodity.

### PROCUREMENT

- Malting barley contracting programs provide benefits to buyers and growers.
  - Secure a base of malting barley production.
  - Minimize volatility in purchasing.
  - Developing long term business relationships with growers.
  - Spread risk.

### Have Malt Barley Contracting Programs Improved? Yes!



### Summary and Outlook

- Growers will raise malting barley under the following criteria.
  - It must be profitable in comparison to corn, soybeans, wheat, and other crops.
  - It must have crop insurance.
  - It must provide an acceptable risk/reward scenario.
- U. S. buyers need to support growers with stable contract and delivery programs to maintain a consistent supply of malting barley.

### Contact Information

- The North Dakota Barley Council can provide follow-up education on malting barley.
  - Crop enterprise analysis (production costs & returns).
  - Contracting production with growers.
  - Crop insurance.
  - Comparative risk evaluation with other crops.
- For further information  
Steven Edwardson, M. Sc.  
Executive Administrator  
North Dakota Barley Council  
1002 West Main Avenue #2  
West Fargo, ND 58079  
Tel: 701-239-7200  
Email: steven.edwardson@ndbarley.net  
Internet: www.ndbarley.net

