

NORTH DAKOTA BARLEY COUNCIL

SUMMARY OF ACTIVITIES REPORT TO 2023 NORTH DAKOTA LEGISLATURE NORTH DAKOTA BARLEY COUNCIL 1002 MAIN AVENUE WEST #2 WEST FARGO, NORTH DAKOTA 58078

EXECUTIVE SUMMARY

Maintaining barley as an agronomically viable and economically profitable crop in North Dakota crop rotations requires a balanced approach to variety development, crop management, risk management, and market development. The North Dakota Barley Council continues to focus on this balanced approach, which is also inclusive of educational program implementation.

Refinement and expansion of the comparative risk analysis education program for malting barley in relation to wheat, corn, soybeans, and canola continues to be a primary success in assisting malt barley procurement teams (buyers) in understanding the complexity of risks faced by barley producers. The North Dakota Barley Council has supported the research required to implement this education program, which has been very well received by the malting and brewing industry. Many buyers (procurement professionals) have minimal to no background in production agriculture, and thus a quantitative approach to helping them understand crop production risk is very beneficial. At present, this educational program on risk is the only one of its kind related to barley.

Historically, North Dakota has produced mainly 6 row barley varieties for the malting and brewing industry. In recent years, the industry has shifted to utilization of more 2 row varieties, thus resulting in growers shifting from 6 row to 2 row production to meet the changing needs of the end user. Growers have adapted well to producing more 2 row production thanks to new varieties and refined crop management techniques.

Risk management education and shifting from 6 row to 2 row barley variety production represent two primary successes for North Dakota barley in recent years. These are possible thanks to the investment in research and development, market development, risk management, and agricultural policy which collectively provide the support necessary to achieve results in keeping barley viable for North Dakota growers.

The following sections of this report highlight the structure and function of the Barley Council, the categories of focus for Barley Council activities, and future considerations related to barley production trends and priorities. The main priorities for the Council include: 1) maintaining a balanced approach to variety development, crop management, risk management, and market development; and 2) monitoring opportunities to expand barley production in North Dakota.

OVERVIEW

The North Dakota Barley Council (hereinafter referred to as the "Council") was created by the 1983 North Dakota Legislative Assembly. The mission of the Council is to protect and foster the health, prosperity, and general welfare of the people by protecting and stabilizing the barley industry and economy of barley producing regions in North Dakota. Active involvement by barley producers guides the efforts of the Council. A five person board governs the Council. County representatives, selected by fellow barley producers, elect a representative from each of five districts. These five representatives, or Council members, become the governing board for the Council.

Council members are eligible to serve a maximum of three consecutive four year terms. Each of the five council districts is approximately equivalent in barley production, although geographic size among

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districts varies considerably. Policies and projects adopted by the Council are implemented by an Executive Administrator along with support staff and allied organizations.

The activities and duties of the Council are supported by an assessment of 20 mills (two cents) per bushel collected from barley producers at the first point of sale. Producers who object to the assessment may, within 90 days following collection of the assessment, apply to the Council for a refund. In recent years, assessments refunded range from 2.8% to 4.1% of gross revenue.

CATEGORIES OF FOCUS

For the current biennium, the activities of the Council have focused on 6 categories: 1) research; 2) market development and promotion; 3) agricultural policy; 4) market intelligence; 5) risk management; and 6) information services. The following sections provide highlights of Council activities in each category.

Research

Maintaining stability in barley production is dependent upon implementing and supporting a research program that develops barley varieties that are agronomically sound. Components of research supported by the Council include the following:

- 1) Barley Pathology: the Council supports research efforts that improve the ability of barley to withstand disease pressure. Key efforts in barley pathology include:
 - a) Fusarium Head Blight (FHB): Since 1993, FHB continues to be problematic for barley producers. FHB has minimal effects on yield, but impacts quality due to seed level infections of deoxynavalenol (DON). Fungicide treatments have improved, and there are currently no practical forms of genetic resistance in current germplasm. The Council, along with other North Dakota and Minnesota grower organizations, continues to serve as a principal agent in the United States Wheat & Barley Scab Initiative (USWBSI), which has obtained over \$5 million per year in federal funding to conduct research on FHB and DON. Scientists at USDA-ARS and NDSU continue to study the complexity of FHB. Continued research is needed to ensure the development of a disease resistant malting barley cultivar.
 - b) Net Blotch: the spot form of net blotch is a relatively new threat to barley. The pathogen damages leaf tissue, thus reducing photosynthetic active areas and ultimately reducing yield. The Council is supporting research conducted jointly by NDSU and USDA-ARS to further evaluate the behavior of the pathogen while simultaneously searching for genetic resistance and other management strategies.
 - c) Gene Transformation: advancements in genetics provide research scientists with significantly powerful tools to understand the impact of genetic mechanisms on disease resistance, thus ultimately impacting crop yield and quality. The Council supports research at the USDA – ARS Barley Genetics Laboratory in Fargo to utilize transgenics for the purpose of improving disease resistance in future cultivars.
- 2) Barley Variety Development: the Council works closely with North Dakota State University to develop new barley varieties for North Dakota barley producers. Barley variety development is largely focused on malting varieties, with limited focus on development of new feed varieties. Genesis (2 row) is a recent malting barley release from NDSU that demonstrates the results of Council efforts. Additional 2 row varieties are in development to meet the needs of the malting and brewing industry, as this industry shifts to increased utilization of 2 row barley. The Council also works closely with the malting and brewing industry in evaluating malt quality and its relationship to variety development and production.
- 3) Crop Management: Malting barley must be delivered in a “living state” (i. e. the crop must be able to be germinated in the malt house in order to produce malt). Barley requires considerable management by the grower. Consequently, barley varieties must be agronomically viable and economically profitable. The Council monitors innovations in crop management (e. g. weed

control, disease control, harvest timing, soil fertility) and subsequently supports research that will provide growers with enhanced management practices for barley production.

- 4) Biotechnology: advancements in biotechnology have contributed to yield increases in corn and soybeans by removing barriers to yield. The Council continues to evaluate biotechnology tools (both transgenic and non-transgenic) and their potential application to sustain barley production.
- 5) Malt Quality: the Council supports research at NDSU which focuses on analyzing quality characteristics of malted barley and relating these characteristics to variety development. This integrated approach assists in providing targeted education to maltsters and brewers on malting barley varieties and their utilization.

Market Development & Promotion

- 1) Domestic: In the domestic market, the Council remains active in promoting barley utilization in the following categories:
 - a. Malting and Brewing: Approximately 90% of barley planted in North Dakota is targeted to the malting and brewing industry. The Council maintains strong working relationships with the largest maltsters and brewers in the United States. Maintaining these ongoing relationships includes the following components.
 - i. Quality Specifications: Since the onset of FHB in 1993, the Council has consistently worked with domestic maltsters and brewers to reduce unrealistic and unobtainable quality guidelines that have lowered the selling price of malting barley. Sound scientific research shows that nominal levels of DON can be utilized throughout the malting and brewing process without adversely impacting the final product. The use of barley containing even minute levels of DON is much less a quality concern among brewers than it is a concern about public perception.
 - ii. Education: The Council provides education to the malting and brewing industry to assist them in understanding the complexity and risk of barley production. This is critically important since many procurement professionals have no background in production agriculture. The Council has delivered educational programs on barley production risks to the Craft Brewers Association, the World Brewing Congress, the World Barley, Malt, and Beer Conference, and to procurement teams in many malting and brewing companies. The Council has also been actively involved in coordinating the summer barley tour for craft brewers, thus educating this industry about barley production and how it is impacted by competing crops.
 - b. Livestock: The Council has supported research conducted at North Dakota State University that evaluates the inclusion of barley in a variety of ration formulations for ruminant and non-ruminant animals. Research indicates that barley can enhance the utilization of DDGS (dried distillers grains, which are a by-product of ethanol production) when both products are placed in rations for ruminant animals.
 - c. Human Food: the Council supports barley food ingredient application research at the Northern Crops Institute (NCI) in Fargo. Product formulations have been developed for various bakery goods, thus providing the food ingredients industry with the foundation for implementing commercial formulations for new product introduction. Barley ingredient specifications have also been developed to assist buyers in understanding ingredient constituent levels (e. g. protein, beta-glucans, etc.). The U. S. Food and Drug Administration (FDA) issued a health claim for barley that allows food processors to promote the benefits of barley in cardiovascular health. The Council is working with U. S. Grains Council to promote barley ingredient utilization in Japan, Korea, and Taiwan.
 - d. Energy: advancements in processing and extraction technology are stimulating interest in the utilization of numerous agricultural products (e. g. corn, wheat, barley, cellulose,

etc.) in ethanol production. Historically, barley utilization in ethanol has been minimal, in part due to the abrasive nature of barley and its subsequent excessive wear on handling and processing equipment. The Council, at the request of its county representatives, monitors the potential for barley utilization in ethanol production. This could provide an alternative market outlet for barley depending upon market conditions.

- e. Pet Food: barley utilization in pet food is a growing market outlet for North Dakota barley producers. Approximately 15% to 20% of North Dakota barley production is marketed to the pet food industry, thus representing a growing trend for barley utilization. The Council monitors pet food market dynamics, assists buyers in developing barley specifications for pet food, and provides education to growers on pet food market trends.
- 2) International: International market development consists of the following components.
- a. U. S. Grains Council: the majority of Barley Council export promotion activities are accomplished through the affiliation of the Council with the U.S. Grains Council (USGC). The USGC has a network of offices located in key foreign countries and conducts market development and promotion programs in over 100 countries worldwide. The USGC program, valued at approximately \$25 million annually, provides the Council with access to key decision-makers (buyers, processors, and users) throughout the world. Due to the pandemic, the Council interacted with USGC and potential customers in a virtual format in Japan, Korea, Taiwan, Thailand, southeast Asia, Mexico, and Central America.
 - b. Procurement Teams: The affiliation of the Council with USGC provides the opportunity to bring procurement teams (buyers) to North Dakota to meet with barley producers and researchers. Direct face to face dialog with foreign buyers provides a unique opportunity to improve knowledge of the market structure, production capabilities, supply, quality, and reliability of the North Dakota barley marketing system. The Council has hosted foreign trade delegations from Japan, Taiwan, Korea, Mexico, China, and other nations. This level of relationship building provides the foundation for long term export market development.
 - c. Emerging Markets: being cognizant of emerging market opportunities for North Dakota barley requires continuous attention to market intelligence. The Council has been actively promoting malting barley in Central America (Guatemala, Cost Rica, Nicaragua, and the Dominican Republic), Mexico, Panama, and Colombia in cooperation with USGC. This region of the world is seeking the counsel of North Dakota in developing future supply chain agreements for malting barley. Business potential in this region is positive due in part to the completion of free trade agreements between the United States, Panama, and Colombia.
 - d. China: Economic growth in China is creating opportunities to supply malt and malting barley for the rapidly growing brewing industry. The Council is working with USGC to improve its understanding of market potential for malt and malting barley in China.
 - e. Free Trade Agreements: The Council monitors the status of FTA's, which are vital to allow market access for U. S. barley in targeted markets. The Colombian and Panamanian FTA's are examples of agreements that require implementation to remove trade barriers for U. S. barley.

Agricultural Policy

The Council believes in providing a holistic program in agricultural policy covering nearly all aspects affecting North Dakota barley producers. The Council has been very active on domestic policy issues at the federal level. Components of domestic policy issues include:

- 1) Farm Bill: The Council works closely with the National Barley Growers Association and the North Dakota Grain Growers Association to maintain support for barley in farm bill development, and

more recently in the Corona Virus Food Assistance Program (CFAP). Key objectives that were achieved include: 1) increasing the reference price for barley to \$4.95 per bushel; 2) maintaining the agricultural risk protection act (ARPA) for crop insurance development; 3) increasing the loan rate for barley from \$1.95 per bushel to \$2.50 per bushel, thus reflecting the shift in value of barley as an ingredient utilized in malting and brewing applications; 4) securing CFAP payments for each market segment of barley (i. e. malting, livestock feed, and pet food). The Council continues to monitor the utilization of current components impacting barley in both CFAP and the farm bill, thus providing a foundation of information for addressing the needs of barley in farm policy negotiations.

- 2) Chemical harmonization: The Council participates in meetings involving chemical harmonization. Chemical harmonization has different meanings to different entities. To the EPA, it means harmonization of protocols between countries. To chemical companies, it means the same registration procedure across international boundaries. But to growers, it means access to chemicals at the same price provided to international (Canadian) producers. The Council has been active in working with EPA and the chemical companies as a means of obtaining international access to affordable crop protection products.
- 3) Organization Alliance: The Council recognizes the importance of developing alliances with other grower organizations that can provide complementary support to strengthen Council objectives. The Council works closely with the National Barley Growers Association and the North Dakota Grain Growers Association in farm policy, crop insurance, transportation, wetlands mitigation, and other areas of state and federal legislation that impact barley producers, thus providing unified support for North Dakota barley.

Market Intelligence

Monitoring the intricacies of barley markets requires increased levels of detail, thus providing the information to evaluate trends and determine potential opportunities. The Council has implemented the following efforts in market intelligence.

- 1) Data Mining: Advancements in computer technology are providing new avenues for developing in-depth quantification of domestic and international markets. The Council has supported research in the department of Agribusiness and Applied Economics at NDSU to mine consumer databases to identify market trends for barley ingredients. The initial focus has been on the domestic (U. S.) market for human food while simultaneously evaluating opportunities in pet food. The objective is to quantify the size of the market and evaluate trends in barley ingredient utilization. Once the initial protocols are established, the Council plans to expand data mining efforts into malting and pet food in the domestic market, as well as targeted international markets. This information will assist the Council in identifying opportunities for barley utilization in the domestic and international marketplace.
- 2) Market Research Services: the Council utilizes public and private market research services to monitor activities in barley production and utilization. USDA Economic Research Service databases provide a macro scale view of domestic and international market trends for barley. RMI Analytics (a private company based in Europe) provides highly focused malting barley market perspectives on the European, Canadian, and Australian markets. The Council utilizes holistic market information from these sources to assist in enhancing contracting programs offered by malting barley buyers.

Risk Management

Malting and brewing companies are continuously focused on minimizing risk. Companies seek barley from multiple geographic locations in an effort to minimize production risk due to widespread crop failure caused by hail, drought, or disease. Likewise, barley growers seek to minimize risk in order to maintain farm profitability. In recent years, growers have shifted from barley to corn and soybeans, as corn and soybeans are relatively easy to produce, require less intensive management than barley, and

demonstrate enhanced profit potential. The decline in barley production has prompted implementation of projects focused on risk management that are beneficial to both growers and buyers of malting barley. Key projects in risk management implemented by the Council currently include the following:

- 1) **Comparative Risk:** barley growers are very aware of the fact that achieving the quality standards for top grade malting barley can be very difficult. Reductions in quality equate to reductions in price and subsequent losses in overall profitability. Growers refer to this phenomenon as “downside risk”, which can be a deterrent to attracting growers to produce barley. The Council is supporting research at the Agribusiness and Applied Economics Department at NDSU to statistically measure downside risk and its implications to barley producers and buyers. The project compares the relative risks of producing barley, spring wheat, corn, soybeans, and canola in North Dakota. The results of this research are being utilized in educating barley procurement managers in the malting and brewing industry, many of which possess no background in production agriculture. This information has assisted in enhancing malting barley contracting programs.
- 2) **Crop Contracting:** malting barley has become a specialty crop produced under contract for the malting and brewing industry. Malting barley contracting programs are relatively new compared to other specialty crops (e. g. dry edible beans, mustard, etc.). The Council has provided guidance to malting barley buyers in implementing contracting programs that are mutually beneficial to both growers and buyers. Contracting programs assist both buyers and growers in mitigating risks in production and purchasing. Council efforts have resulted in implementing contracting programs in North Dakota from major malting and brewing companies, thus providing growers with improved market outlets and prices.
- 3) **Crop Insurance:** The administration and implementation of affordable and practical crop insurance is becoming increasingly complex for agricultural producers. Crop insurance is evolving beyond the typical yield and revenue products. USDA-RMA administers yield protection (YP) and revenue protection (RP) insurance products for a wide variety of crops. However, malting barley is subject to numerous quality parameters (e. g. test weight, germination, mycotoxins, etc.) that also pose a risk to producers. To that end, the Council is working closely with USDA-RMA, the National Barley Growers Association, and private insurance product developers to continue refinement of a new crop insurance product for malting barley that is more reflective of the risks faced by growers. The new insurance product (Malt Barley Endorsement [MBE]) utilizes data on barley quality from the malting and brewing industry, thus resulting in an insurance product that is reflective of production risks and industry practices. Malting barley is a specialty crop, and thus each component of barley crop insurance needs to be re-evaluated. The Council has: 1) developed a comprehensive price database to assist USDA-RMA in understanding the shift from open market to contracted production; 2) implemented procedures that utilize a local market price in lieu of a USDA derived price for calculating indemnities, thus providing improved coverage for growers; and 3) assisted USDA-RMA in refining loss adjustment procedures.

Information Services

The Council allocates resources to many other issues that impact barley producers. The Council serves as an information clearinghouse for barley producers, processors, end users, other grower organizations, and government officials, all of which depend on accurate information from which to base their decisions. Advancements in information technology are providing the Council with the tools necessary to deploy barley related information. Council activities in information services include but are not limited to the following:

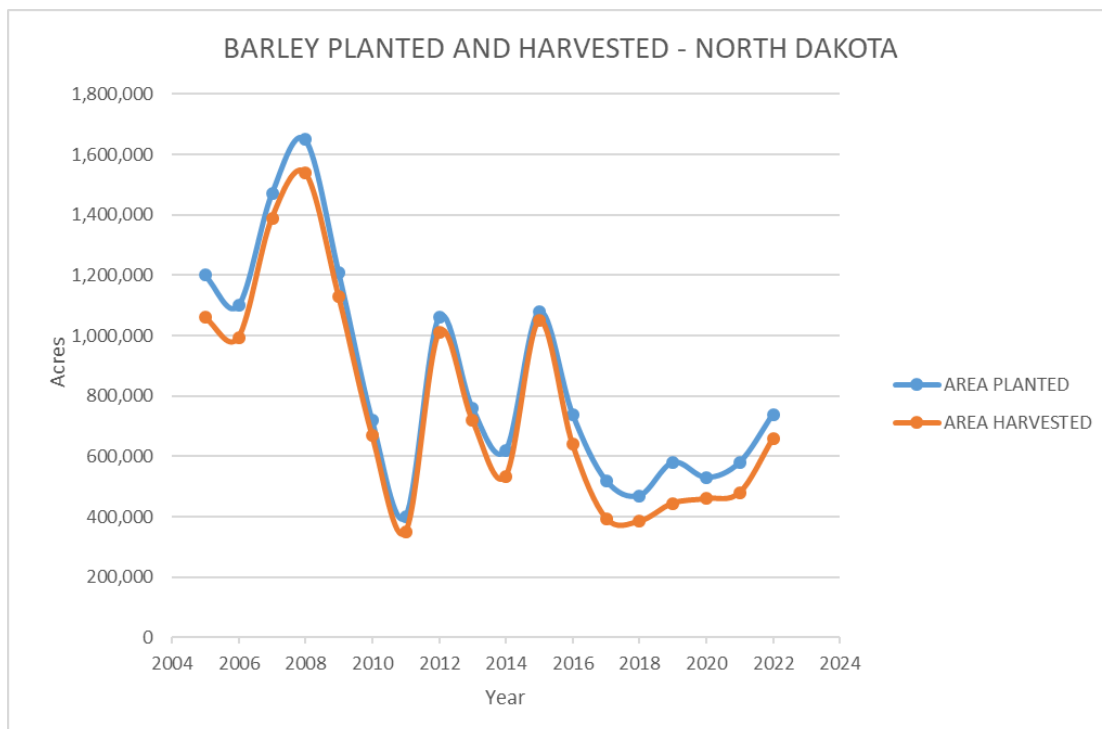
- 1) **Web Site:** the Council continues to update its web site to provide barley related information on a global basis. Refinements to the web site continue to be developed and implemented.

- 2) Trade Shows and Conferences: the Council participates in key agricultural trade shows in North Dakota (e. g. KMOT Ag Expo) and grower conferences (e. g. Prairie Grains Conference) to provide updated information on barley production, processing, and utilization.
- 3) Presentations: Council staff and directors deliver targeted presentations at a variety of education events (e. g. extension service meetings, trade team seminars, agricultural conferences, etc.) to promote barley production, processing, and utilization.
- 4) Data Management: the Council is in the early stages of developing of a holistic information management system to mine, cleanse, format, and deploy data on barley production, quality, movement, and utilization. A framework of this nature is necessary to provide barley related information in the age of internet and computerized information technology.

The Council recognizes the importance of providing barley related information to producers, processors, government and business decision makers, and end users. Consequently, the Council monitors the application of information technology as a key component to information management and deployment.

FUTURE CONSIDERATIONS

At present, area planted to barley in North Dakota has stabilized in the range 450,000 to 650,000 acres, as evidenced in the following chart (data source: USDA-NASS).



On average, barley contributes approximately \$625 million dollars in economic activity on an annual basis in North Dakota. North Dakota continues to rank in the top 3 states of barley production, and accounts for approximately 20% to 25% of U. S. barley production. There are approximately 2,500 to 3,000 barley producers in the state.

The barley industry in North Dakota is in a state of transition and consolidation. Malting barley has become a specialty crop that is procured as an ingredient rather than traded as a commodity. Barley production has generally stabilized in the area of 30 million bushels in recent years.

Table 1. Summary of Barley Production in North Dakota, 2017 – 2022 (source: USDA-NASS).

PRODUCTION TRENDS FOR NORTH DAKOTA BARLEY							
Source: USDA - NASS							
	2017	2018	2019	2020	2021	2022	AVERAGE
Yield							
--Bushels per acre	65	74	72	63	51	73	66
--Kilograms per hectare	3,494	3,978	3,870	3,386	2,741	3,924	3,565
Area Planted							
--Acres	520,000	570,000	580,000	530,000	580,000	740,000	586,667
--Hectares	210,600	230,850	234,900	214,650	234,900	299,700	237,600
Area Harvested							
--Acres	400,000	385,000	445,000	460,000	430,000	66,000	364,333
--Hectares	162,000	155,925	180,225	186,300	174,150	26,730	147,555
Production							
--Bushels	26,000,000	28,490,000	32,040,000	28,980,000	21,930,000	48,180,000	30,936,667
--Metric Tonnes	566,089	620,303	697,596	630,972	477,474	1,049,007	673,573

North Dakota barley producers face significant challenges in maintaining barley as a profitable crop enterprise in their farming operations. As the Council looks ahead to the 2023 – 2025 biennium, the Council intends to maintain its focus in the key categories of research, market development and promotion, agricultural policy, market intelligence, risk management, and information services as outlined in this report. The application of biotechnology tools to barley variety development and production will continue to be carefully explored. At present, the Council projects lower but stable barley production for the next biennium. Careful budgeting, supplemented with carryover funds, should allow the Council to maintain its program efforts at current levels while simultaneously striving to increase barley production in North Dakota.

NORTH DAKOTA BARLEY COUNCIL			
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STATEMENT OF PROJECTED REVENUES AND EXPENDITURES			
For the Current and Next Biennium			
2021 - 2023 and 2023 - 2025			
(UNAUDITED)			
Prepared by the North Dakota Barley Council			
		2021 - 2023	2023 - 2025
REVENUES		BIENNIUM	BIENNIUM
Assessment Revenues Collected from First Purchases		1,300,000.00	1,300,000.00
Interest and Other Income		35,000.00	35,000.00
Accrual Adjustments		0.00	0.00
-->Total Revenues:		1,335,000.00	1,335,000.00
EXPENDITURES			
General Administration			
--Salaries and Benefits		398,000.00	398,000.00
--Office Rental		17,000.00	17,000.00
--Office Supplies, Postage, Printing, etc.		5,000.00	4,000.00
--Information Technology (Programming, Maintenance)		7,000.00	7,000.00
--Insurance, equipment rental, equipment repair, other		6,000.00	5,000.00
Research, Development, Promotion, and Education			
--Travel		150,000.00	155,000.00
--Grants & Professional Services		730,000.00	730,000.00
Miscellaneous			
--Refunds		32,000.00	32,000.00
Total Expenditures		1,345,000.00	1,348,000.00
Net Gain (Loss)		(10,000.00)	(13,000.00)
*Research, development, promotion, and education includes funds expended for variety development, market development (including travel), grower and customer education programs, promotional expenses, and related services.			