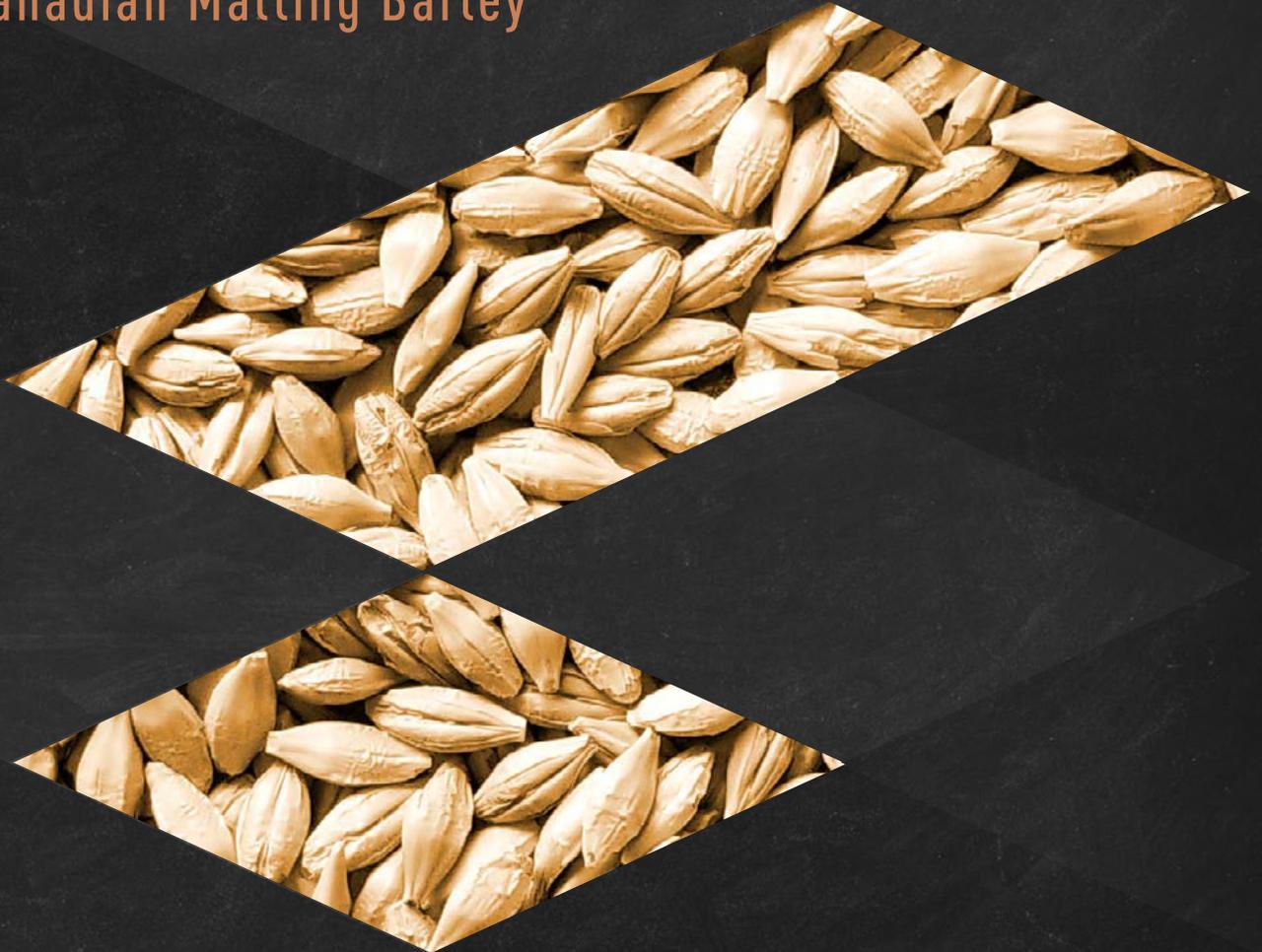




CMBTCTM
CANADIAN MALTING BARLEY TECHNICAL CENTRE

2016-2017 ANNUAL REPORT

Supporting the commercialization
of Canadian Malting Barley



PURPOSE

Founded in 2000, the Canadian Malting Barley Technical Centre (CMBTC) is a national, independent, non-profit industry organization that provides malting and brewing technical expertise to the Canadian malting barley value chain. Funding is provided by members of the malting barley, malt and brewing industries as well as by farmers and provincial and federal government.

The CMBTC offers a suite of activities to members, stakeholders and customers including technical services, marketing support, applied research as well as education and training. Based in Winnipeg, Manitoba, the CMBTC facilities include a state-of-the-art malting plant and brewery. The CMBTC also operates the Malt Academy, an educational program that offers technical courses on malt processing and brewing to members of the Canadian and international malting industry, with a focus on Canadian malting barley varieties.

The CMBTC is governed by a Board of Directors comprised of Tier 1 members. The Board provides leadership, oversight and guidance, and essential connections to the malting barley sector that we proudly serve.

MANDATE, MISSION & VISION

CMBTC Vision

In collaboration with our partners, our vision is to help ensure Canada is a leader in supplying high-quality malting barley to the global malting and brewing industries, meeting the needs of customers around the world.

CMBTC Mission

Our mission is to enhance the competitiveness of Canadian malting barley through technical services, applied research, marketing support, communications and education.

Questions or comments about this publication or the information contained within it may be directed to:

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MESSAGE FROM THE CHAIR

DALE MATCHETT



To say that 2016 - 2017 year was a challenging year for the Canadian malting barley industry would be an understatement. Persistent wet conditions during the growing season and harvest led to quality issues including fusarium and pre-sprouting that significantly limited the amount of selectable malting barley and affected the entire value chain. The crop did have redeeming qualities however such as high-test weight, plump kernels and better than expected yields. In spite of the quality challenges, Canadian malting barley continued to be in demand, particularly in China where we saw a record export program.

Our industry is evolving. After a period of steady decline, malting barley seeded area in western Canada stabilized in the past two years. This occurred as farm-gate prices strengthened, and as maltsters and grain companies increasingly offer more sophisticated contracts that are attractive to farmers. Today's malting barley farmer in Canada is experienced and knowledgeable, producing some of the world's finest barley destined for brewing. Coupled with world class breeding programs and a grain sector that knows how to execute the sourcing and delivery of this value-added grain, Canada has gained a solid reputation for premium quality on the global market.

For the past three years I have had the distinct pleasure of serving as the CMBTC Board Chair and will continue to do so for the coming year. The professional CMBTC staff continue to provide stability and quality leadership during this era of both challenge and opportunity. On behalf of the Board of Directors and the team, I thank you for demonstrating your support by choosing to be members of the CMBTC.

Sincerely,

Dale Matchett



MANAGING DIRECTOR'S MESSAGE

PETER WATTS

In 2016-2017 the malting barley industry in Canada faced significant difficulties associated with crop quality, but also enjoyed some positive developments such as rising demand for Canadian malting barley from China – our largest export market – and continued strong exports of processed malt. It has been a similar story for the past three years.

During this period the CMBTC has responded to member needs to help navigate the challenges as well as capitalize on the opportunities presented by market growth. In the Spring of 2016 the CMBTC traveled to China to offer on-site assistance to two malting companies experiencing process difficulties with Canadian malting barley. The successful resolution of this issue demonstrated the value of the CMBTC's technical support services to optimize the performance of Canadian barley.

Meanwhile with rising demand for Canadian malting barley in the global market, Canada has been faced with the challenge of gaining acceptance for newer varieties that are competing with tried and true varieties such as AC Metcalfe. New varieties offer higher yields and better disease resistance which will ultimately make the Canadian industry more competitive. To this end the CMBTC conducts pilot tests with new varieties, communicates the results of these tests with industry, and coordinates a sample distribution program providing end-users with small quantities of new varieties for testing. In addition the CMBTC is working with partners to supply plant-scale quantities in container for production trials in China.

At the CMBTC we made progress in streamlining operations to improve services to stakeholders. For example in the past year we shortened our turnaround time on processing and analytical services, enhanced our stakeholder communications, and improved our systematic promotion of new varieties to end-users. We also organized an incoming new-crop tour with 11 representatives from six Chinese malting companies. CMBTC staff were active in representing the industry at conferences and events as well as visiting members across Canada and the world during 2016 and 2017. Going forward the CMBTC will continue to take proactive steps to ensure that connections with our national and global membership are solid and that we continue to provide value to our members.

As a CMBTC member, you've made an important investment in our organization and expect results, and we are committed to continually enhancing services to our members and the broader malting barley industry in future. We are motivated by the opportunities that lie ahead in this exciting industry.

Cheers!

Sincerely,

Peter Watts



CMBTC BOARD OF DIRECTORS 2016 - 2017

CHAIR

Dale Matchett

Merchant, Malt Barley
Richardson International

TREASURER

Marta Izydorczyk

Research Scientist and
Program Manager
Research on Barley
& Other Grains
Crops Section
Grain Research Laboratory

SECRETARY

Lorelle Selinger

North American
Merchandising Manager
Cargill Malt

MEMBER

Aaron Beattie

Assistant Professor
Barley & Oat Breeding
Program, Crop Development
Centre, University of
Saskatchewan

MEMBER

Kenric Exner

Merchandizing Manager
Viterra



L - R: Kenric Exner, Dale Matchett, Marta Izydorczyk,
Aaron Beattie, Lorelle Selinger

MEMBERSHIP

The CMBTC was pleased to welcome two new members in 2016-17 including Hyaline Malting (Tier 3) and the Manitoba Wheat & Barley Growers (Associate). The following is the list of members as of March 31, 2017.

CURRENT MEMBERSHIP



OUR VALUES

INTEGRITY

Conduct affairs in honest, ethical manner; follow through on commitments.

PROFESSIONALISM

Uphold consistent, high standard in all services, programs and communications; demonstrate respect and listen to members and stakeholders.

STEWARDSHIP

Recognize responsibility to represent the Canadian malting barley industry; ensure services meet members' needs; demonstrate value for investment.

ACCOUNTABILITY, TRANSPARENCY

Execute mandate, achieve targets and report results and finances in open and transparent manner.

THE CANADIAN MALTING BARLEY TECHNICAL CENTRE

2016-17 OVERVIEW

Canadian malting barley area was up 2.4% in 2016 vs. 2015 at 1.386 million hectares (3.42 million acres) with strong prices prior to seeding. After years of declining area, malting barley seedings have stabilized since 2014. Six row area as a percentage of total malting barley area has continued to decline, reaching an all time low of 5.7% in 2016 (down from 6.5% in 2015). CDC Copeland succeeded AC Metcalfe as the most widely seeded malting barley variety for the first time this year (AC Metcalfe had been No. 1 since 2002). CDC Copeland area was double AC Metcalfe in Alberta however AC Metcalfe remained the top seeded variety in Saskatchewan.

Demand for malting barley from China, our largest export market, increased in 2016-17 with record shipments of 835,000 tonnes (T), up from 675,000 T the previous year, with an estimated export value of CDN \$335 million. In contrast, demand south of the border was limited at 150,000 T after two successive good

quality malting barley crops in the United States (U.S.). Canadian processed malt exports were firm in 2016-17, reaching 620,000 T, more than half of which went to the U.S. due to continued strong demand from the craft brewing sector.

With the challenges in terms of crop quality, the CMBTC was called upon regularly to provide technical support to buyers and suppliers both in Canada and internationally, including a technical mission to China.

A highlight of 2016-17 was a new crop tour hosted by the CMBTC for customers of Canadian malting barley. Eleven representatives from six Chinese malting and brewing companies participated in the incoming mission including COFCO, Supertime, Tsingtao, Yantai Hyaline, Hailar and JSFEC. The tour took place in Winnipeg, Calgary and Vancouver during August.



CMBTC CORE ACTIVITIES 2016 - 2017

TECHNICAL SERVICES

New Crop Quality and Performance Evaluation

Each year the CMBTC conducts pilot-scale malting and brewing trials to evaluate the quality of new crop Canadian malting barley. Commercial samples of selected barley are collected from grain and malting companies at harvest. Malting and brewing trials are conducted under simulated commercial processing conditions. Quality analysis and process performance data is generated for barley, malt and beer quality parameters including:

RAW BARLEY

Moisture, protein, germination energy, water sensitivity, rapid visco-analysis (RVA), test weight, sizing, weathering and other quality indicators

PROCESSED MALT

Fine and coarse extract levels, diastatic power, alpha amylase, Free Amino Nitrogen (FAN), total and soluble protein, Kolbach Index, friability and beta-glucan

BREWING PROCESS

Conversion and filtrations times, colour, turbidity (clarity), apparent extract, alcohol, pH, carbohydrates, bitterness and foam stability

In 2016-17 the CMBTC conducted 19 new crop (2016) pilot malting and brewing trials with selected samples of barley including CDC Copeland, AC Metcalfe, AAC Synergy, Newdale, Bentley, Celebration and Legacy. The data from these trials was used to generate the CMBTC's annual New Crop Quality Report which is distributed each year to members, end-users and other stakeholders. The information enables end-users to optimize processes and the performance of Canadian malting barley each year.

2016 New Crop Pilot Trials

6 CDC Copeland	1 Bentley
6 AC Metcalfe	1 Celebration
3 AAC Synergy	1 Legacy
1 Newdale	

New Variety Quality and Performance Evaluation

In addition to new crop evaluations, the CMBTC conducts micro (1-2 kgs of barley) and pilot-scale (50 kgs of barley) malting and brewing trials to evaluate the quality of new Canadian malting barley varieties (e.g. newly registered varieties as well as breeder or seed company lines, pre-registration). Samples are collected after harvest from grain companies, malting companies, breeders and seed companies. Quality analysis and process performance data is generated for barley, malt and beer quality parameters, similar to new crop.

In 2016-17, the CMBTC conducted 140 micro-malting trials with breeder and seed company developmental lines. In addition, 16 pilot-malting and 16 pilot-brewing trials were conducted with new barley varieties including AAC Connect, CDC Bow, Lowe and CDC Fraser.

Test results are communicated to the Canadian malting barley value chain and used to promote new malting barley varieties domestically and internationally to facilitate their acceptance and adoption by end-users.



MARKETING SUPPORT

Technical Support

Quality challenges with the 2016 Canadian malting barley crop led to significant technical support needs on behalf of buyers of Canadian malting barley. For example in 2016 the CMBTC developed a new rapid quality evaluation system for cargo shipment samples to test for two factors: pre-germination/storability of the barley (using the RVA test) in addition to a water sensitivity test. These tests provide the buyer with important information to allow them to plan for the arrival and processing of the barley after shipment. A new "certificate" for these two tests is now provided by the CMBTC.

The CMBTC also provides direct problem solving support to buyers. In the fall of 2016, Dr. Yueshu Li, the CMBTC's Director of Operations, traveled to China to visit two malting facilities that were experiencing processing difficulties with Canadian malting barley. With the support of Dr. Li, both companies were able to overcome processing issues and optimize malt quality. This type of after-sales service provided by the CMBTC to its members is a key component of Canada's position as the world's leading supplier of quality malting barley.

Cargo Quality Evaluation

The CMBTC's quality evaluation program for export cargoes is a unique service that provides sellers and buyers with malting and brewing performance data on actual malt barley shipments. Using the CMBTC pilot facilities, a composite 50 kg sample of the loaded cargo is sent to the CMBTC for processing and analysis, with results provided to the seller before the shipment arrives at the end-use destination.

With the increase in exports to China in 2016-17, the CMBTC conducted 26 cargo quality evaluations on the majority of Canadian malting barley offshore shipments representing 691,000 tonnes.

Cargo quality evaluations help end-users to realize the full quality potential of the malting barley they have purchased, by maximizing its performance, avoiding processing difficulties, and facilitating efficiencies and cost effective processing.

Incoming China Mission

In August of 2016, the CMBTC and its members hosted 11 people from six Chinese malting and brewing companies for one week to learn about new Canadian malting barley varieties. During the visit, representatives had the opportunity to visit Canadian farms and handling and export facilities. The companies that participated on this mission included Tsingtao, Supertime, COFCO, Yantai Hyaline, Hailar and JSFEC, together representing the majority of China's malting barley purchases from Canada.

Sample Distribution Program

Each year the CMBTC supplies micro scale samples (2-10 kilograms) of new crop and new Canadian malting barley varieties to international customers. In 2016-17 the CMBTC assisted buyers of Canadian malting barley in China and the U.S. to secure samples of new Canadian malting barley varieties including AAC Synergy, AAC Connect, CDC Bow and CDC Clear.



APPLIED RESEARCH

CMBTC Applied Research Projects

Each year the CMBTC undertakes a number of applied research initiatives that are designed to address industry challenges related to quality and processing or to support the marketing of Canadian malting barley. In some cases, research is conducted for members on a proprietary basis. The following are the major non-proprietary applied research initiatives carried out at the CMBTC in 2016-17:

- Rapid performance assessment of barley and malt in the malting and brewing process by Near Infrared Diffuse Reflectance Spectroscopy
- Quality potential of Canadian hullless malting barley variety CDC Clear
- Prospective demand for malting barley and malt quality for the global brewing industry

CMBTC Sensory Work

In 2016-17 the CMBTC held bi-weekly sensory panels to evaluate the quality of beer brewed at CMBTC with new crop and new varieties, as well as for research projects. The trained sensory panel has approximately 15 members. As one of the world's only independent sensory panels, this applied research component of the CMBTC suite of technical expertise offers the ability to evaluate the impact of varieties, weather and geography on the sensory and flavour properties of the end product.

Competitor Analysis

In 2016-17, barley analysis and micro-malting trials were conducted with eight malting barley varieties from Europe as part of a project to understand the quality characteristics of European barley, a competitor in the international market place. Results were shared with members and the research community to help understand the quality potential of these varieties.

Malting Trials According to End-User Protocols

Malt process regimes are different around the world, depending on various factors such as climate and ground water temperature. Pilot scale malting trials were conducted in 2016-17 with Canadian malting barley varieties according to malting conditions specified by potential markets for Canadian malting barley. The results from these trials will be used to help support market development efforts in markets unfamiliar with Canadian malting barley.



COMMUNICATION / EDUCATION

Reports and Publications

In 2016-17 the CMBTC shared reports, publications, and crop and market updates with members and stakeholders via email as well as through our regularly updated website and social media platforms. The following publications and reports were issued to members during the year:

- 2017-18 Recommended Varieties List - November 2016
- Collaborated with the Canadian Grain Commission's GRL on the 2016 Quality of Western Canadian Malting Barley (annual publication) - November 2016
- 2016 New Crop Quality Evaluation - preliminary report December 2016, final report March 2017
- 2015 Cargo Quality Reports Summary - February 2017
- 2016 new variety Malting & Brewing Trials for AAC Synergy, AAC Connect and CDC Bow - March 2017

Presentations and Conference Participation

The CMBTC is proud to regularly present at farmer and industry conferences to share information on new crop quality, new varieties, market and industry outlook data as well as the latest in research. The following conferences, symposiums and farmer events were attended by CMBTC staff during 2016-17:

- US Craft Brewers Conference (P. Watts, A. Nguyen) - Philadelphia, May 3-5, 2016
- US Craft Maltsters Guild Annual Meeting (P. Watts, A. Nguyen) - Philadelphia, May 5 2016
- World Brewing Congress - Joint conference with American Society of Brewing Chemists and Master Brewers Association of the Americas (P. Watts, Y. Li, A. Nguyen, A. Onio, B. Lodge: Delivered 3 poster presentations) - Denver, August 11-15, 2016
- Eastern Barley Symposium (P. Watts presented) - Montreal, Nov. 17-18, 2016
- AMBA Barley Genetics Improvement Symposium (Y. Li) - San Diego, January 4-5, 2017
- MBAA Eastern Technical Conference (P. Watts, Y. Li) - Etobicoke, January 19-21, 2017
- Farm Tech 2017 (P. Watts presented) - Edmonton, January 28-29, 2017
- Prairie Grain Development Committee (P. Watts, Y. Li) - Winnipeg, February, 2017
- Syngenta Malt Days (P Watts presented) - Olds, February, 2017
- Syngenta Malt Days (Y Li presented) - Saskatoon, February, 2017
- In addition, the CMBTC provided 16 presentations and tours to Canadian International Grains Institute (CIGI) programs (April 2016 - March 17)

2017-18 Recommended Malting Barley Varieties

The following varieties of two-row and six-row malting barley are registered with the Canadian Food Inspection Agency (CFIA) based on good agronomic properties and malting quality criteria. These varieties have been pilot scale tested by the CMBTC and exhibit good malting and brewing characteristics. In addition to market opportunities, seeding decisions should be based on agronomic considerations and feedback from your grain company representatives, local elevator operators or malting companies. Visit the CMBTC website at www.cmbtc.com for detailed pilot malting and brewing data.

Two-Row Varieties		Six-Row Varieties	
VARIETY	MARKET COMMENTS	VARIETY	MARKET COMMENTS
CDC Copeland	Established Demand	Legacy	Limited Demand
AC Metcalfe	Established Demand	Tradition	Limited Demand
AAC Synergy	Growing Demand	Celebrations	Limited Demand
Beritely	Limited Demand		
Newdale	Limited Demand		
CDC PolarStar	Limited Demand		
CDC Kindersley	Under Commercial Market Development		

New Varieties in Development
The following varieties have been registered with CFIA and are undergoing seed propagation. Both varieties have been pilot scale tested at the CMBTC and exhibit good quality characteristics suitable for all malt and adjunct brewing styles.

VARIETY	COMMENTS
AAC Connect	Two-Row - Undergoing seed propagation
CDC Bow	Two-Row - Undergoing seed propagation

The following companies have pedigree seed distribution rights for those varieties that are footnoted:

1 - SaCan	2 - CANTERA SEEDS
3 - FP Genetics	4 - Syngenta

For Barley or Newdale contracting opportunities contact Canada Malting Company. For CDC PolarStar and CDC PlatinumStar contracting opportunities contact Prairie Mal-Cargill.

The CMBTC and its members recommend:

- Talk with your local malting barley buyer about opportunities in your area to grow and market two-row and six-row malting barley varieties.
- Use certified seed to ensure varietal purity, reduce disease incidence and increase the likelihood of selection for malt.

Questions? Call your selector, seed company, grain handling company or contact the CMBTC.

cmbtc.com
Peter Watts - Managing Director
Tel: 204-982-1951 | E-mail: peter@cmbtc.com
Dr. Yanhua Li - Director of Malting & Brewing Operations
Tel: 204-984-0501 | E-mail: yli@cmbtc.com

CMBTC 2016 MALTING BARLEY CROP QUALITY ASSESSMENT

Quality by nature

Social Media

The CMBTC's growing social media presence is supported by multiple platforms, which are regularly updated.

In 2016-17, the CMBTC:

- Had more than 10,000 website hits
- Had 586 Twitter followers
- Had 284 followers on its Facebook page
- Posted new videos to its YouTube channel, showcasing its malting and brewing processes



THE CMBTC MALT ACADEMY

The CMBTC's **Malt Academy** offers unique training and education programming. The flagship 1-week intensive course in malt processing offers participants theoretical and practical hands-on instruction using the CMBTC's state-of-the-art 75 kg pilot Malthouse and Joe White micro-malting unit. The Academy also offers a 3-day program focused on the Canadian malting barley value chain including breeding and varietal development, production, handling, malt processing and brewing. During 2016-17, the CMBTC held one 2-week, four 1-week and two 3-day Malt Academy courses involving approximately 100 registrants, (record attendance).

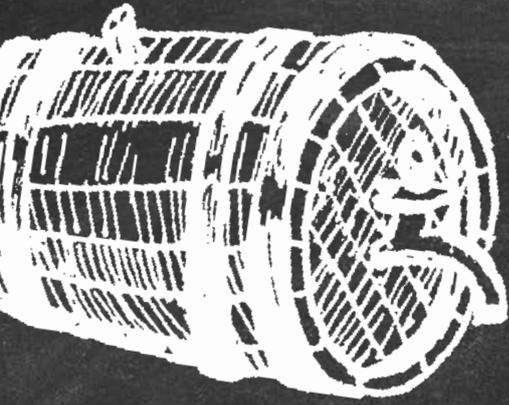
Committee Participation

The CMBTC participated in the following industry committees during 2016-17:

- BMBRI Technical Committee (Y. Li)
- CGC Barley and Other Cereal Grains Sub-Committee (P. Watts)
- Prairie Recommending Committee for Oat & Barley - Prairie Grain Development Committee (Y. Li, P. Watts)
- Barley Council of Canada - Market Development Committee (P. Watts)
- Barley Council of Canada - Best Management Practices Committee (P. Watts)
- Winnipeg Brewmasters Executive (P. Watts)
- Manitoba Brewers Association (A. Nguyen)



Malt Academy 1-Week Intensive
Malting Course: Summer 2016



CMBTC 2016-17 *expenditures*

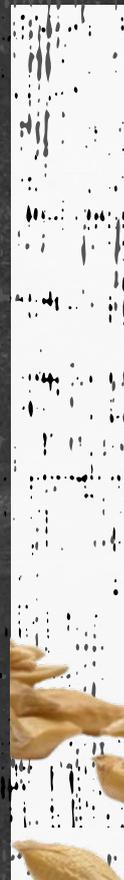
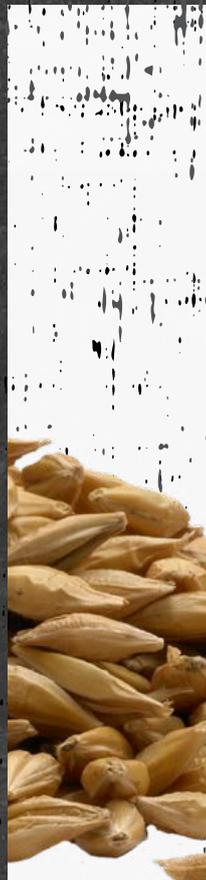


CMBTC 2016-17 revenues



27% Membership
\$309,003

3% Technical
Consulting
\$38,344



34% AAFC
(Agrimarketing)
\$390,000

18% Farmer
Contributions
\$209,588

2% Other Revenue,
Interest
\$16,061

16% Malt Academy
\$180,358

CMBTC STAFF LISTING 2016 - 2017



Managing Director
Peter Watts



Office Administrator
Rose Marie Bemrose



Director of Malting & Brewing Operations
Dr. Yueshu Li, PHD



Malting & Brewing Technical Specialist
Aaron Onio



Malting & Brewing Technical Specialist
Andrew Nguyen



Malting & Brewing Technician
Bryce Lodge



Malt Plant Technician
Sherwin Santiano



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