

40TH Barley Improvement Conference



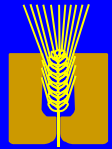
**NO BARLEY
NO BEER**

Hacienda Hotel, San Diego, California
January 11-12, 2015

A close-up photograph of a field of golden barley grain, showing the texture of the stalks and the heads of the grain. The background is a soft-focus field of similar grain.

Sponsors

**American Malting Barley Association
Idaho Barley Commission
Idaho Grain Producers Association
Minnesota Barley Research & Promotion Council
Montana Grain Growers Association
Montana Wheat & Barley Committee
National Barley Growers Association
North Dakota Barley Council
Washington Grain Commission**



American Malting Barley Association, Inc.

REGULAR MEMBERS (23)

AB-InBev (MO)

Bell's Brewery (MI)

Boston Beer (MA)

Briess Malt & Ingredients (WI)

Brooklyn Brewery (NY)

Brown-Forman (KY)

Cargill Malt (MN)

Craft Brew Alliance (OR)

Deschutes Brewery (OR)

Dogfish Head Craft Brewery (MD)

Gambrinus Company (TX)

Great Western Malting (WA)

InteGrow Malt (ID)

Malteurop (WI)

MillerCoors (IL)

New Belgium Brewing (CO)

New Glarus Brewing (WI)

Oskar Blues (CO)

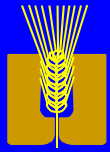
Rahr Malting (MN)

Schell's Brewing (MN)

Sierra Nevada Brewing (CA)

Stone Brewing (CA)

Summit Brewing (MN)



American Malting Barley Association, Inc.

ASSOCIATE MEMBERS (46)

Abita Brewing (LA)

Alaskan Brewing (AK)

Allagash Brewing (ME)

Anchor Brewing (CA)

Avery Brewing (CO)

Bear Republic Brewing (CA)

Big Sky Malts (MT)

Blacklands Malt (TX)

Blue Ox Malthouse (ME)

Boulevard Brewing (MO)

Cold Spring Brewing (MN)

Colorado Malting (CO)

Deer Creek Malthouse (PA)

Farm Boy Farms (NC)

Firestone Walker Brewing (CA)

Flying Dog Brewery (MD)

Founders Brewing (MI)

Full Sail Brewing (OR)

Gold Rush Malt (OR)

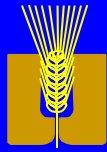
Harpoon Brewery (MA)

Langunitas Brewing (CA)

Lakefront Brewery (WI)

Left Hand Brewing (CO)

Leopold Bros Distillery (CO)



American Malting Barley Association, Inc.

ASSOCIATE MEMBERS (46)

Long Trail Brewing (VT)

Lost Coast Brewery (CA)

Malterie Frontenac (QC)

Matt Brewing (NY)

Odell Brewing (CO)

Oran Station (NY)

Penns Mault (PA)

Pilot Malt House (MI)

Rahr & Sons Brewing (TX)

Real Ale Brewing (TX)

Riverbend Malt House (NC)

Rogue Ales (OR)

Russian River Brewing (CA)

Saint Arnold Brewing (TX)

Schlafly Beer (MO)

Smuttynose Brewing (NH)

Straub Brewery (PA)

Troegs Brewing (PA)

Urban Chestnut Brewing (MO)

Valley Malt (MA)

Victory Brewing (PA)

Wachusett Brewing (MA)



American Malting Barley Association, Inc.

(Founded in 1938 as the Malt Research Institute)

MISSION: The primary purpose of AMBA is to encourage and support an adequate supply of high quality malting barley for the malting, brewing, distilling and food industries and increase our understanding of malting barley.

VISION: To be the leader in improvement, development, and understanding of malting barley.

American Malting Barley Association, Inc.

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Previous Strategic Plan

AMBA's **primary objective** is the development of six-row and two-row malting barley varieties broadly adapted for the barley production areas of North America with suitable agronomic, malting, and brewing performance.



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PRIMARY OBJECTIVES

Enhance barley competitiveness with other crops.

*Foster and support research that helps develop higher yielding public sector malting barley varieties with characteristics that **mitigate production risk factors** to increase acceptance rates.*

Foster and support research that helps develop traits for public and private sector malting barley varieties that **mitigate production risk** factors to increase acceptance rates.

Favorable federal farm programs, including crop insurance, that **mitigate production risks to growers and that do not favor other crops over barley.**

AMBA

National Coordinator of US Malting Barley Research

Facilities



Funding

AMBA, BA
Federal, State,
Growers, Brewers,
Maltsters



**Adequate & Effective National
Public Sector
Barley Research Infrastructure**



Direction



Personnel

AMBA lobbies Congress & federal agencies, primarily through its leadership of the NBIC; and state universities, to positively impact all these research infrastructure components

AMBA also lobbies with barley growers for favorable federal farm program provisions (e.g. crop insurance)

National Barley Research Program

AMBA Strategic Goals

- **Technology to accelerate variety development**
 - e.g. latest DNA tracking technology
 - NOT GM
- **Management practices**
- Increased Yields
- **Winter Varieties**
- **Resistance to Abiotic Stress**
 - drought, heat, cold
- Lodging resistance
- **High Test Weight**
- Improved Quality
 - **Quality evaluation for breeding programs**
 - Preharvest sprouting
 - **Fermentability prediction**
 - Glucanase assays
 - **Flavor screening of barley**

National Barley Research Program

AMBA Strategic Goals

- **Food Safety**
- Increased secondary uses
 - Food, Feed, Straw for biofuels
- **Insects (RWA, Bird cherry oat aphid)**
- Disease Resistance
 - **Ug99 Stem Rust**
 - Fusarium head blight (scab)
 - **Barley yellow dwarf virus**
 - Cereal yellow dwarf virus
 - **Bacterial leaf streak**
 - Stripe rust
 - **Root diseases**
 - Net blotch
 - **Septoria speckled leaf blotch**
 - Spot blotch
 - **Powdery mildew (winter barley)**

MALTING BARLEY BREEDING GUIDELINES IDEAL COMMERCIAL MALT CRITERIA

	<u>Six-Row</u>	<u>Adjunct Two-Row</u>	<u>All Malt Two-Row</u>
AMBA Member Interest*	20%	55%	25%
Barley Factors			
Plump Kernels (on 6/64)	> 80%	> 90%	> 90%
Thin Kernels (thru 5/64)	< 3%	< 3%	< 3%
Germination (4ml 72 hr. GE)	> 98%	> 98%	> 98%
Protein	≤ 13.0%	≤ 13.0%	≤ 12.0%
Skinned & Broken Kernels	< 5%	< 5%	< 5%
Malt Factors			
Total Protein	≤ 12.8%	≤ 12.8%	≤ 11.8%
on 7/64 screen	> 60%	> 70%	> 75%

* Based on a survey of AMBA's Regular Members.

JUNE, 2014

MALTING BARLEY BREEDING GUIDELINES

IDEAL COMMERCIAL MALT CRITERIA

	<u>Six-Row</u>	<u>Adjunct Two-Row</u>	<u>All Malt Two-Row</u>
Measures of Malt Modification			
Beta-Glucan (ppm)	< 120	< 100	< 100
F/C Difference	< 1.2	< 1.2	< 1.2
Soluble/Total Protein	42-47%	40-47%	38-45%
Turbidity (NTU)	< 10	< 10	< 10
Viscosity (absolute cp)	< 1.50	< 1.50	< 1.50
Congress Wort			
Soluble Protein	5.2-5.7%	4.8-5.6%	< 5.3%
Extract (FG db)	> 79.0%	> 81.0%	> 81.0%
Color (°ASBC)	1.8-2.5	1.6-2.5	1.6-2.8
FAN	> 210	> 210	140-190
Malt Enzymes			
Diastatic Power (°ASBC)	> 150	> 120	110-150
Alpha Amylase (DU)	> 50	> 50	40-70

General Comments

- Barley should mature rapidly, break dormancy quickly without pregermination and germinate uniformly.
- The hull should be thin, bright and adhere tightly during harvesting, cleaning and malting.
- Malted barley should exhibit a well-balanced, modification in a conventional malting schedule with four day germination.
- Malted barley must provide desired beer flavor.

40TH Barley Improvement Conference

12:00 PM - LUNCH - *El Pueblo Room*

One level up

1:15 PM - Afternoon Technical Session

La Palma Room

3:30 – 5:00 PM

Hot Topics and Emerging Issues

Preharvest Sprouting

Beer Flavor, Does Barley Matter?

40TH Barley Improvement Conference

**5:30 PM - Barley Contributions to Beer Flavor
Project Tasting**

Seating may be Limited - El Pueblo Room

6:00 PM - HOSPITALITY – *El Pueblo Room*

7:00 PM - BANQUET – *El Pueblo Room*

One Brewer's Observations on Malt Flavor

JOSEPH HERTRICH

Retired Group Director, Brewing Raw Materials

Anheuser Busch, Inc.

12th International Barley Genetics Symposium
June 26 – 30, 2016
Minneapolis, MN

