



American Malting Barley Association, Inc.

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REGULAR MEMBERS

AB-InBev
Bell's Brewery
Boston Beer
Briess Malt & Ingredients
Brooklyn Brewery
Brown-Forman
Cargill Malt
Craft Brew Alliance
Deschutes Brewery
Diageo
Dogfish Head Craft Brewery
Full Sail Brewing
Gambrinus Company
Great Western Malting
Heineken Mexico
InteGrow Malt
Malteurop North America
MillerCoors
New Belgium Brewing
New Glarus Brewing
Odell Brewing
Oskar Blues Brewery
Rahr Malting
Schell's Brewery
Sierra Nevada Brewing
Skagit Valley Malting
Stone Brewing
Summit Brewing

ASSOCIATE MEMBERS

Abita Brewing
Alaskan Brewing
Allagash Brewing
Anchor Brewing
Ballast Point Brewing & Spirits
Bear Republic Brewing
Big Sky Malts
Blacklands Malt
Blue Ox Malthouse
Boulevard Brewing
Brewery Vivant
C'N'C Malting
Cold Spring Brewing
Colorado Malting
Deer Creek Malthouse
Double Eagle Malt
Epiphany Craft Malt
Firestone Walker Brewing
Flying Dog Brewery
Founders Brewing
Georgetown Brewing
Great Lakes Brewing
Harpoon Brewery
Lagunitas Brewing
Lakefront Brewery
Left Hand Brewing
Leopold Bros Distillery
Long Trail Brewing
Lost Coast Brewery
Malterie Frontenac
Matt Brewing
Mecca Grade Estate Malt
Nebraska Malt
New Holland Brewing
Oran Station Brewing Supplies
Pilot Malt House
Rahr & Sons Brewing
Real Ale Brewing
Riverbend Malt House
Rogue Ales
Russian River Brewing
Saint Arnold Brewing
Schlafly Beer
Southern Tier Brewing
Sprecher Brewing
Straub Brewery
Sun King Brewing
Troegs Brewing
Uinta Brewing
Urban Chestnut Brewing
Utah Brewers Cooperative
Valley Malt
Victory Brewing
Wachusett Brewing

MISSION: *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.*

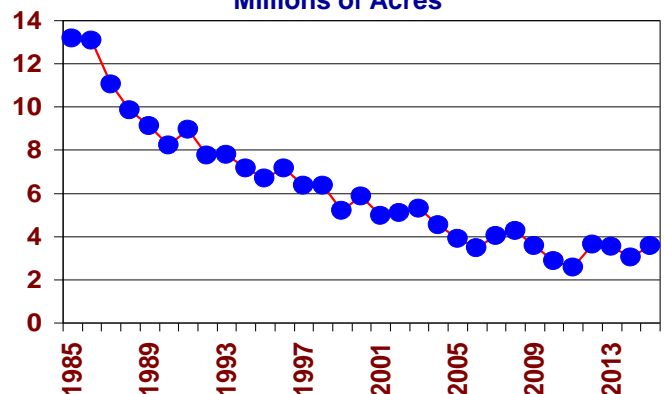
VISION: *To be the leader in improvement, development, and understanding of malting barley.*

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.

US Barley Acreage

Millions of Acres



- 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.

Barley is primarily a public sector non-GM crop, with most barley research and development at state universities and USDA-ARS facilities.



Little interest by biotechnology seed companies in barley research & variety development.
Low acreage = limited seed sale potential

Barley is facing stiff competition from corn, soybeans, canola, wheat, and other crops that are receiving substantial private sector investment, including GM variety development, and that have more favorable federal farm program provisions.

MEETING AMBA'S MISSION. OBJECTIVES & CHALLENGES

RESEARCH – To keep barley competitive with other crops requires an adequate national barley research infrastructure of personnel, facilities, and operating funds to conduct appropriate research. AMBA works to meet that goal and serves as a national coordinator of US malting barley research.

AMBA research funding of state university and USDA Agricultural Research Service (ARS) researchers totals about \$530,000/year to programs in seventeen states (CA, CO, ID, MI, MN, MT, NC, NE, ND, OH, OK, OR, TX, VA, VT, WA, WI).

AMBA Strategic Goals for National Barley Research Program

Malting Barley Variety Development

Spring 2-Row > 6-Row

Priority AMBA goals & research areas

- Improved technologies to accelerate variety development
- Increased yields
- Winter Varieties – Higher yield, less water use and earlier harvest than spring types.
- Resistance to abiotic stress (drought, heat, cold, preharvest sprouting)
- Lodging resistance
- National and regional screening nurseries
- Breeding Program Priorities
 - Idaho – Spring 2-row; Winter 2-row (Gongshe Hu, USDA-ARS, Aberdeen)
 - Minnesota – Spring 2 & 6-row; Winter 2-row (Kevin Smith, University of Minnesota)
 - Montana – Spring 2-row (Jamie Sherman, Montana State University)
 - Nebraska – Winter 2-row (Stephen Baenziger, University of Nebraska)
 - North Dakota – Spring 2 & 6-row (Richard Horsley, North Dakota State University)
 - North Carolina – Winter 2-row (David Marshall, USDA-ARS, Raleigh)



- Oregon – Winter 2-row (Pat Hayes, Oregon State University)
- Virginia – Winter 2-row & 6-row (Carl Griffey, Virginia Tech)
- Washington – Spring 2-row (Kevin Murphy, Washington State University)

Management Practices

Quality

- Quality evaluation of lines and varieties (USDA-ARS Cereal Crops Research Unit, Madison, WI & AMBA member testing)
- Flavor screening of barley
- Fermentability prediction
- Glucanase assays

Pest Resistance

Insects

Russian wheat aphid and Bird cherry-oat aphid = crop damage, virus transmission



Diseases

Fusarium Head Blight (Scab)
Ug99 African & Other Stem Rust
Net Blotch – *Spot & Net forms*
Cereal Yellow Dwarf Virus
Barley Yellow Dwarf Virus
Septoria Speckled Leaf Blotch

Bacterial Leaf Streak
Powdery Mildew
Stripe Rust
Root diseases
Spot Blotch

Increased secondary uses – Additional markets for barley not used or accepted for malting and straw to bolster grower returns.

Animal Feed



Biofuels



Food



AMBA leads the National Barley Improvement Committee (NBIC) - Barley growers, researchers, malting, brewing, and cereal food end-users NBIC has successfully lobbied Congress & USDA for barley research funding

- **\$20 million in one-time funding for new ARS research facilities**
- **\$10.2 million increase in annual base barley research funding** last 15 years at various ARS research locations
- Major research initiatives to address disease challenges & enhance genomic research



New ARS Cereal Crops Research Unit, Madison, WI



Addition to ARS National Small Grains Germplasm Research Facility, Aberdeen, ID



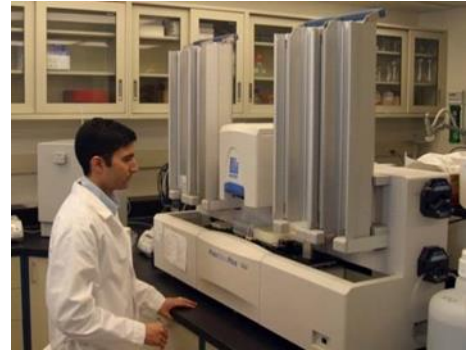
Addition to ARS Cereal Disease Laboratory, St. Paul, MN



\$5.0 million/year Fusarium Head Blight (Scab)



\$3.0 million/year Ug99 African Stem Rust



\$2.5 million/year – Small Grains Genotyping Labs (KS, ND, NC, WA)

- **\$9.4 million cumulative** funding – Congressional earmark for USDA National Institute of Food & Agriculture (NIFA) **US Barley Genome Project (USBGP; 1990-2010)**
- USBGP led to award of NIFA competitive grant of **\$5 million for the Barley Agricultural Coordinated Agricultural Project (Barley CAP; 30 scientists from 19 institutions, genomic research; 2006-2010)**
- Barley CAP led to award of NIFA competitive grant of **\$25 million for the Triticeae (barley & wheat) Coordinated Agricultural Project (T-CAP; 56 scientists from 28 institutions, genomic research; 2011-2015)**

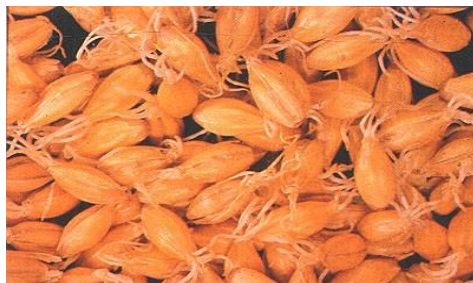
In addition to securing federal funding, AMBA also has substantial input into how funding is utilized with its connections to state and federal research programs and service on oversight committees. With the current federal budget situation, with cutbacks in federal spending, AMBA's primary goal now is to preserve the funding previously obtained.

AMBA Quality Evaluation Program

Early generation malting quality screening at ARS Cereal Crops Res. Unit, Madison, WI (5,000 + lines a year from public sector breeding programs)

Most promising lines submitted to AMBA collaborative member pilot scale evaluation program (35 lines per year; 2 years per line)

Satisfactory pilot lines may be advanced to AMBA plant scale malting and brewing evaluations by member companies (6-12 lines/year; 1-2 crop year evaluation)



Satisfactory results from plant scale evaluation by at least one member moves a variety to the **AMBA list of recommended malting barley varieties** at that member's request. The annually updated list informs growers of which varieties AMBA members prefer, encouraging their planting.

Federal Farm Programs

Planting decisions of growers are influenced by US farm policies. Policies range from federal support when prices fall to crop insurance when adverse weather conditions impact yields or quality.

AMBA works with the National Barley Growers Association (NBGA) and state organizations lobbying Congress and USDA to put barley on an equal basis with other crops so that barley growers respond to market signals and not government programs.



The Farm Bill

- Helped increase reference prices for barley relative to other crops providing a cushion against a decline in prices or revenue.

Crop Insurance

- Established a new “Specialty Barley” insurance program that covers yield losses for malting and specialty food barleys with affordable premiums.
- Convinced the USDA Risk Management Agency (RMA) to change the way they calculate the coverage rate for barley insurance reducing the risk of growing malting barley.
- Established accurate testing methods for quality specifications used in insuring malting barley against quality losses.



Legislation, Regulation and Liaison

AMBA works with the American Society of Brewing Chemists (ASBC), the Brewers Association (BA), the Beer Institute (BI), NBGA and other organizations on issues of common interest.

AMBA serves as a liaison between growers and the industry.



- Ran collaborative testing programs through the ASBC and the USDA Federal Grain Inspection Service (FGIS) that established accurate measurements of deoxynivalenol (DON) in barley and malt, and preharvest sprouting in barley.
- Worked with a broad coalition during debates on the new Food Safety Bill to ensure realistic traceability requirements for comingled commodities such as malting barley.
- Comments on proposed rules on grain grading, food safety, US energy policy and others.
- Provides an annual recommended malting barley variety list to growers.
- Provides periodic releases on industry concerns with specific crop protectants or crop year specific issues (eg. proper storage conditions).
- Distributes information on barley acreage, production, stocks, and varieties.

AMERICAN MALTING BARLEY ASSOCIATION

American Malting Barley Association, Inc. (AMBA) is a 501c(6) nonprofit trade association.

MEMBERSHIP

Any entity actively engaged in business as a maltster, brewer, distiller, or food manufacturer using malt is eligible for membership. AMBA has two ongoing membership categories, Regular and Associate.

Regular members have a voting representative on the AMBA Board of Directors and Technical Committee, with input into malting barley variety development and all other programs.

2017 Regular Member Dues

Maltsters pay dues of \$4.77 per 1,000 bushels of barley steeped, and distillers and food companies pay \$5.58 per 1,000 bushels of malt consumed the previous calendar year or minimum dues of \$5,083.

Brewers pay dues per the following tier system based on barrels of beer shipped the previous calendar year.

80,000,000-100,000,000	\$294,000	4,000,000-6,000,000	\$16,300
70,000,000-80,000,000	\$245,000	2,000,000-4,000,000	\$10,483
60,000,000-70,000,000	\$212,000	1,000,000-2,000,000	\$9,000
50,000,000-60,000,000	\$180,000	800,000-1,000,000	\$8,333
40,000,000-50,000,000	\$147,000	600,000-800,000	\$7,667
35,000,000-40,000,000	\$122,500	400,000-600,000	\$7,000
30,000,000-35,000,000	\$106,000	300,000-400,000	\$6,667
25,000,000-30,000,000	\$90,000	250,000-300,000	\$6,333
20,000,000-25,000,000	\$73,500	200,000-250,000	\$6,000
15,000,000-20,000,000	\$57,200	150,000-200,000	\$5,667
10,000,000-15,000,000	\$41,000	100,000-150,000	\$5,333
6,000,000-10,000,000	\$26,200	< 100,000	\$5,167

Associate membership is for companies that do not want voting representation but want to help AMBA meet its mission, vision, and objectives, with some membership benefits. Associate member company personnel receive member only email communications on AMBA and barley, including barley planting, production, variety, and stock reports. They also have access to the member only section of the AMBA web site, which has information on malting barley varieties, research, production, and other items. Associate members are welcome to attend AMBA Board and Technical Committee meetings as nonvoting members.

2017 Associate Member Dues

Malting, distilling, and food companies pay the same dues rate as Regular members in their category, with minimum dues of \$525.

Brewing companies pay dues of \$3.33 per thousand barrels of beer shipped the previous calendar year, or minimum dues of \$525.

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