



Get to Know the Craft Malt Movement



CRAFT MALTSTERS GUILD

Hi, I'm Jesse.



Jesse Bussard
Executive Director
Craft Maltsters Guild

ABOUT ME

- Recently moved back to my home state of Pennsylvania after living in Montana for nearly a decade
- Started with the Guild in December 2019
- Previously worked independently as a journalist and communications/PR professional in the agriculture, conservation, and craft beer spaces
- Also ran a beer events promotions company called Fermentana from 2016 to 2021 and founded multiple successful event firsts in Montana
 - Bozeman Craft Beer Week, Beer Maven: A Women's Beer Education Series, and Montana Funk Fest (state's first sour beer & kombucha festival)
- Education
 - Master's of Science in Crop Science - *University of Kentucky*
 - Bachelor's of Science in Animal Science with Minor in Equine Science - *Penn State University*



Craft malting industry beginnings

- First craft malthouse opens in 2008 in Colorado
- Additional industry growth seen in 2010s, when craft brewing was experiencing unprecedented growth
- Bolstered by the local food movement and the rise of more conscientious beer drinkers
- Grassroots organizing lead to formation of the Guild



Guild formation

- The first craft maltsters who spearheaded the industry's early days found themselves fielding calls from fellow start-ups from around the nation and the globe.
- The idea of forming a guild was developed as a way to further the craft and disseminate information around technique and best practices.
- This approach follows in the footsteps of other grain-focused organizations like the [North American Millers Association](#) which was founded in 1902.



North American Craft Maltsters Guild comes onto the scene

Grassroots movement: The Guild is an 501(c)6 trade association founded in July 2013 by eight craft malthouses.

Mission: To promote and sustain the tradition of craft malting in North America (and beyond), provide services and resources to the Association's members, and uphold the highest quality and safety standards for Craft Maltsters.



2014 Member Malthouse Annual Meeting



2015 Member Malthouse Annual Meeting

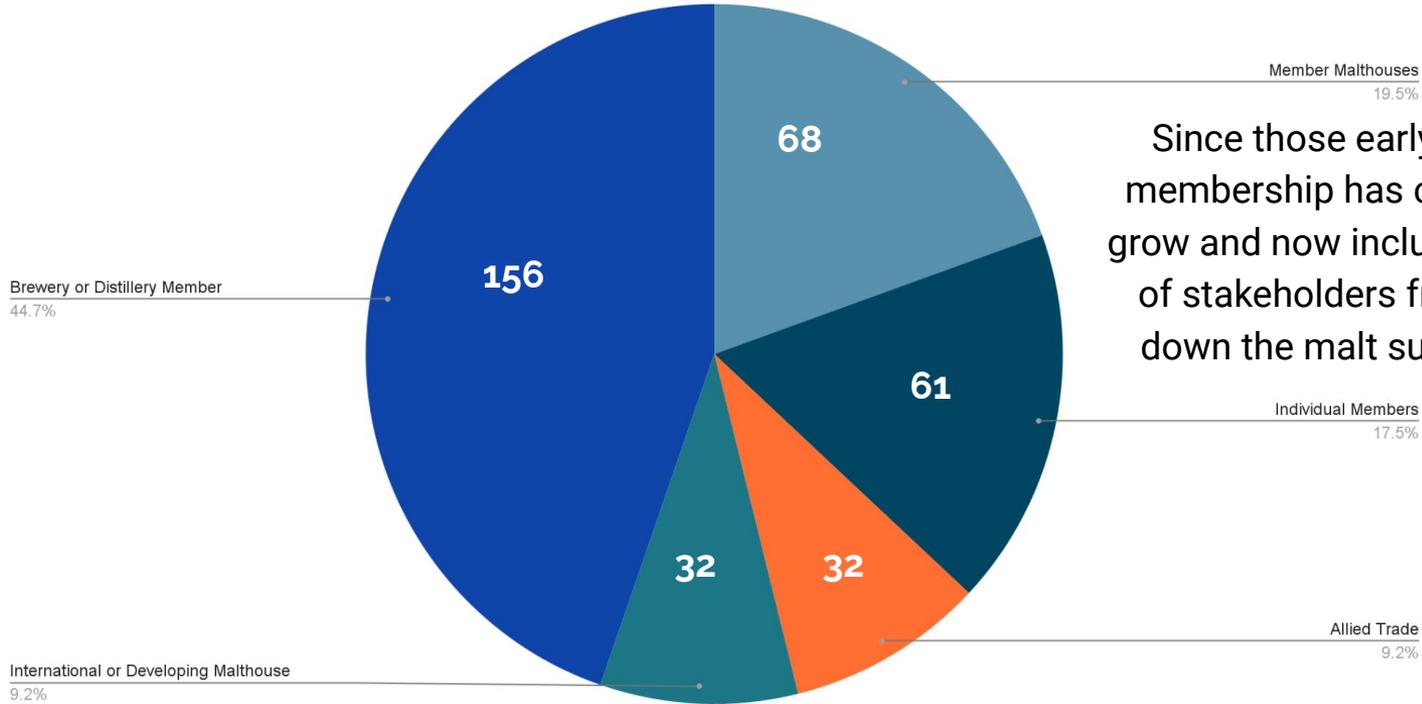


Craft beer meets craft malt.

- The founding board members decided to submit a proposal for a sensory presentation at the 2014 Craft Brewers Conference in Denver, CO. This presentation would become craft malt's formal introduction to a nationwide audience.
- Following this pivotal moment, a significant number of new malthouses opened between 2014 and 2018, helping to grow the Guild's membership. During this period, we expanded our educational offerings on the website and in person.



Guild Membership Breakdown



Since those early days, our membership has continued to grow and now includes a variety of stakeholders from up and down the malt supply chain.



Defining craft malt

The Guild defines a craft malting operation as the following:

- **Small:** Produces between 5 and 10,000 metric tons of malt annually
- **Local:** Sources at least 50% of grains within a 500 mile radius
- **Independent:** Independently owned by a 74% or more majority. Ownership by non-craft malt entities should not exceed 25%.



Industry representation

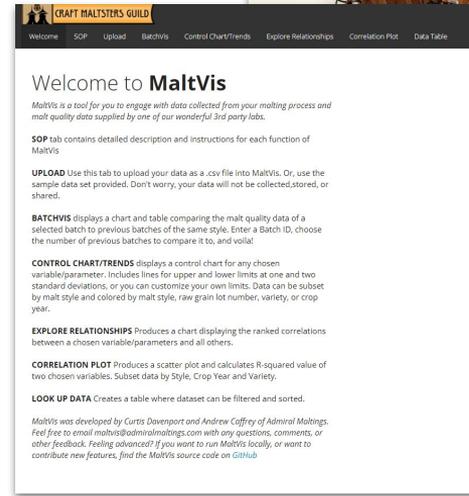
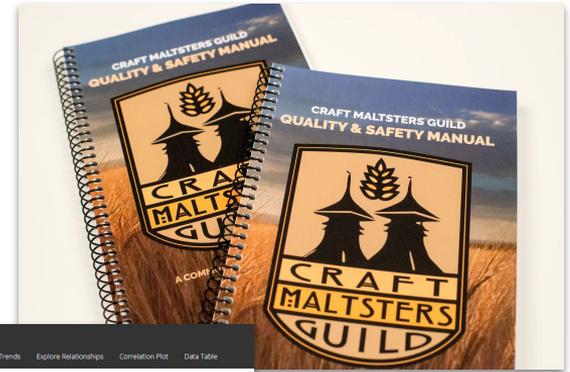
- The Guild provides a unified voice for the 65+ craft malthouses who make up our voting membership
- We also lobby and support efforts in malt barley and other small grains research & funding
 - National Barley Improvement Committee
 - 2020, 2021 - Helped get \$1M in federal funding approved for Barley Pest Initiative in partnership with other industry orgs (e.g., National Barley Growers Association, American Malting Barley Association, etc.)



Quality & Safety

Developing and setting industry quality and safety guidelines

- **Quality & Safety Manual** (*available for purchase in our online store*)
- **MaltVis** (*free, open-source app*)
<https://craftmalting.com/maltvis/>
- **Responsible Production Guide** (*currently in-progress*)
- **HACCP and beyond Guidelines for Craft Maltsters** (*currently in-progress*)



CRAFT MALTSTERS GUILD

Continuing education and professional networking

- **Bi-Monthly Webinars** (6 per year)
 - Topics covered in 2021 include human resources, malt quality, malting data management and analysis, starch and gelatinization temperatures of malt, and sensory science
 - Webinars are free for Guild members, \$20 for non-members
- **Educational classes and workshops**
(Hannah will tell you more about these!)
- **Craft Malt Conference** - February 18-19, 2022



2022 CRAFT MALT CONFERENCE



CRAFT MALTSTERS GUILD

PORTLAND, MAINE
FEBRUARY 18-19, 2022

ONLINE SESSIONS - FEBRUARY 25-26, 2022



Learn more and register at <https://bit.ly/CraftMaltCon22>.



CRAFT MALTSTERS GUILD

2022 Craft Malt Conference

Featured Panel Discussion, “Beyond Brewing: Malt Meets Distilling”

When craft malt houses start looking for customers, craft breweries are the first that come to mind. It's important to cast your nets out to craft malt's newer customer base: craft distilleries. This panel will discuss the American Single Malt movement, the economics of the craft distilling industry, the dynamics of working with craft distillers, and the hope of the direct-to-consumer sales movement.

Panelists are as follows:

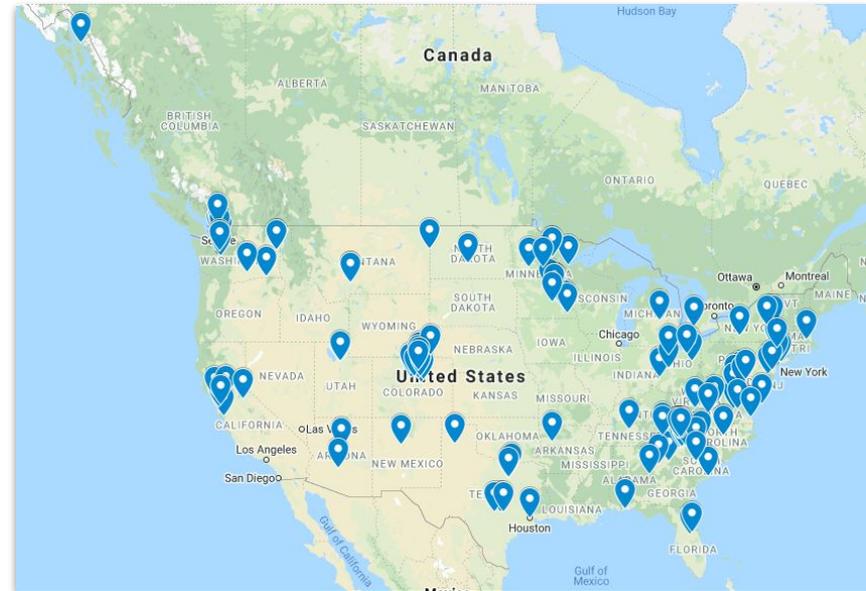
- Jason Parker, Copperworks Distilling Co.
- Randy Thatcher, West Branch Malts and Distillery
- Austin Schumacher, TexMalt
- Rhonda Kallman, Boston Harbor Distillery

Moderated by Becky Harris, Catoctin Creek Distilling / ACSA Board President

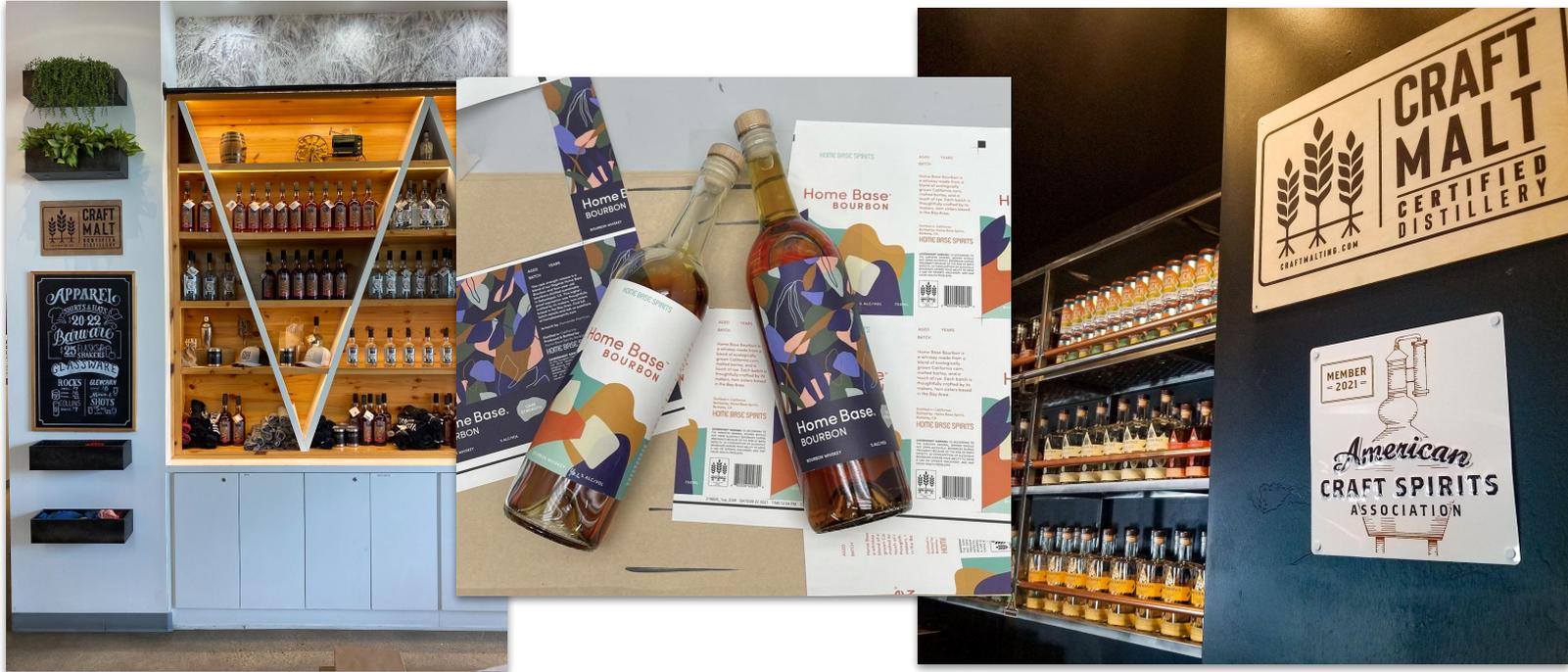


Craft Malt Certified Seal

- Launched in September 2019
- Trademarked seal that allows brewers and distillers to communicate their use of and support for distinctive, locally produced raw materials
- Some examples of how brewers are using the seal include packaged product, taproom signage, and marketing materials
- Approximately 150 craft breweries and distilleries participating in program
 - Currently about 20 of those are craft distilleries



The Craft Malt Seal in the Wild



CRAFT MALTSTERS GUILD

Craft Malt Certified Distilleries

- Bendt Distilling Co. (TX)
- Copper Sky Distillery (CO)
- Copperworks Distilling Co. (WA)
- Garrison Brothers Distilling (TX)
- Hinterhaus Distilling Co. (CA)
- Home Base Spirits (CA)
- The Family Jones Distillery (CO)
- Longtucky Spirits (CO)
- Meadowlark Spirits (MT)
- Pine Bluffs Distilling (WY)
- Still Austin Whiskey (TX)
- Tahwahkaro Distilling (TX)
- Westland Distillery (WA)
- West Branch Malts & Distillery (OH)
- Acre Distilling Co. (TX)
- Amalga Distillery (AK)
- Bozeman Spirits Distillery (MT)
- Oak & Grist Distilling Co. (NC)
- Safe House Distilling (NM)
- Terramar Brewstillery (WA)
- TX Whiskey (TX)
- Stoutridge Winery & Distillery (NY)



HOW TO SIGN UP

Breweries and distilleries interested in signing up for the Craft Malt Certified seal program should follow the following steps to get involved:

1. JOIN THE NORTH AMERICAN CRAFT MALTSTERS GUILD AS AN INDIVIDUAL BREWERY OR DISTILLERY MEMBER.



2. PARTNER WITH A GUILD MEMBER MALTHOUSE TO MEET THE 10% USAGE BASELINE. (PLEASE NOTE, YOU'RE FREE TO WORK WITH OTHER GUILD MEMBER MALTHOUSES UNDER THIS PROGRAM.)



3. SIGN A LICENSING AGREEMENT WITH YOUR MEMBER MALTHOUSE. A GUILD MEMBER MALTHOUSE WILL CERTIFY THAT YOU ARE MEETING THE NECESSARY USAGE THRESHOLDS.



4. RECEIVE THE SEAL AND BEGIN INCORPORATING IT INTO YOUR MARKETING AND PROMOTIONAL MATERIALS. (EACH BREWERY AND DISTILLERY ALSO GET ONE (1) FREE WOODEN CERTIFIED CRAFT MALT SIGN TO HANG IN THEIR TASTING ROOM)



Learn more and sign up
today at
www.craftmalting.com



CRAFT MALTSTERS GUILD

Thank you!

Have questions? Want to connect?

Jesse Bussard, Executive Director

Text me: 814-599-5854

Email me: director@craftmalting.com

Twitter: **@cowgirljesse**

Instagram: **@jessebussard**

Follow the Guild on Twitter, Instagram, and

Facebook: **@craftmalting**

Visit www.craftmalting.com to learn more about
the Craft Maltsters Guild.



CRAFT MALTSTERS GUILD

- Craft Malt -

Highlighting Diverse Benefits



Hannah Turner | Director Barley, Malt & Brewing Quality Lab



Hannah Turner

BS 2014 – Plant Science
MS – 2016 – Plant Science

MSU Barley Breeding Program – 2016 to present
Craft Maltster's Guild BOD/Technical Committee – 2018 to present
ASBC – Technical Committee - 2020 to present
Pink Boots Society – MT Chapter Co-Leader 2021

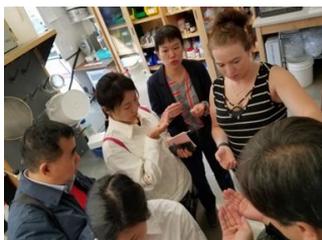




Barley Breeding, Malt & Brewing Quality

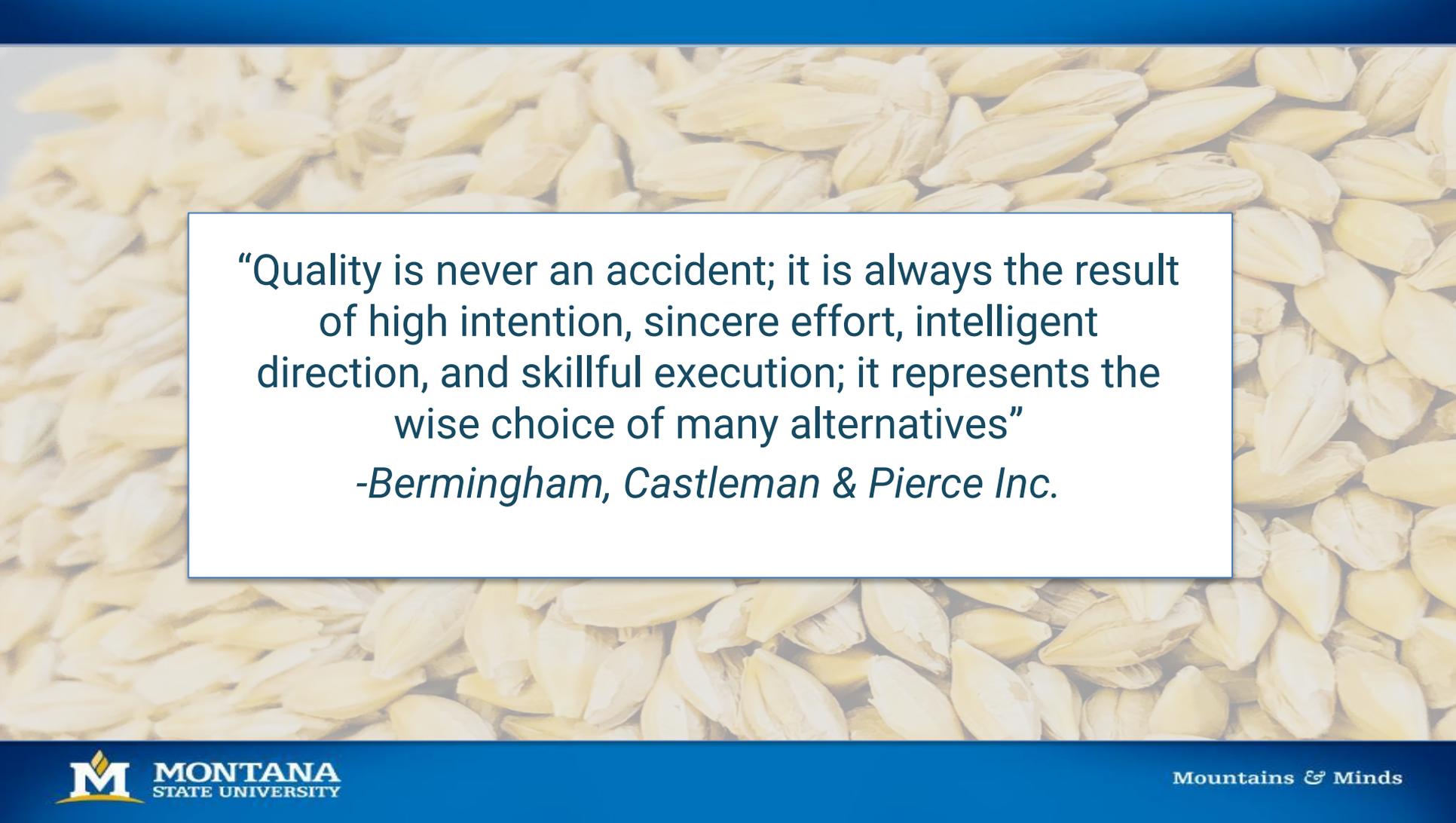
Supporting the region and beyond via

Research | Service | Education



www.montana.edu/barleybreedin

g

The background of the slide is a close-up, slightly blurred image of numerous yellow lentils, filling the entire frame. The lentils are a warm, golden-yellow color and have a characteristic kidney shape.

“Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction, and skillful execution; it represents the wise choice of many alternatives”

-Birmingham, Castleman & Pierce Inc.

Educational Courses

- Advanced Course in Craft Malting Production
 - 4 Days – Farm to fermentation this course covers the foundational knowledge one needs to become a craft maltster
 - Hands on lab – germination tests, moisture evaluations, hot steep sensory
 - Offered annually in conjunction with the Craft Malt Conference
- Malt for Brewers/Distillers
 - Two Days – Covers the critical knowledge needed to understand the making and utilization of malt to optimize end products (flavor, process, quality)
 - Hands on lab – malt intake, grist assessments, hot steep sensory
 - Offered annually – traveling summer course



- Craft Malt Cup
 - Akin to beverage competitions – celebrates quality and flavor!
 - Maltsters get ample feedback – analysis report & sensory feedback
 - Interested to participate – volunteer as a judge!
- Craft Malt Style Guide
 - built by craft for craft – “crowd source sensory”
- Responsible Production Guide
- Expanded Website Assets
 - Sensory, Researcher contact database



Advantages of Craft Malt

- **Relationships**
 - “Your success is our success” – feedback, hands on experiences, collaborations, allies – we’ve got your back!
 - Co-marketing – talk each other up on social! Host joint events – get people talking!
- **Unique Products**
 - Historical processes, hybrid styles, innovative new malts – have an idea? Talk to your maltster and see what they can do!
- **Flavor!**
 - Functionally malt is a long term stable product – but there is something to be said for freshness!
 - Variety, Terroir, Modification – researchers are continually expanding knowledge of how & why these matter
 - Fun fact – the 2021 Malt Cup saw 28 participating malthouses – they submitted malts made from 29 different varieties!
- **Supporting Local = Community stories**
 - Let your customer know the people and places that play into their purchase – your establishment back to the soil your products came from!
 - Flexibility – run out of a product last minute?
 - European style begets European style – save on shipping & get a fresher product - use something local!
 - Certified seal!

Malt Quality Evaluation

Standards

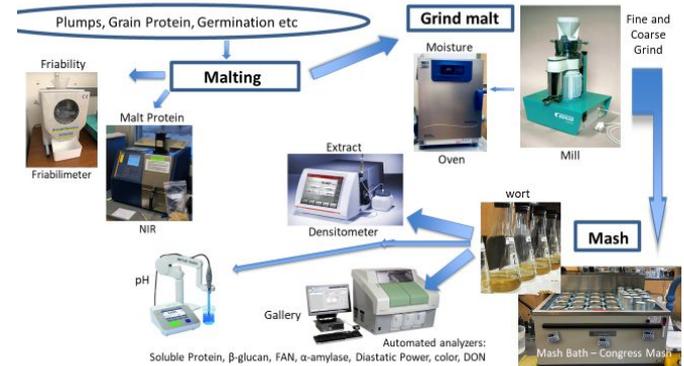
- Nearly as long as we have been malting there have been standards
- In 1482 the city of London decreed that malt must be:

“clene, swete, drye, and wele made, not capped in the Sakkes nor Rawdried malte, dank or wete malte, or made of mowe brent barly, belyed malte, Edgrove malte, acrespired malte, wyvell eten malt or medled”

- Malt must be good, clean, and sweet – not overripe or over grown
- Capped in the Sakkes – no hiding poor malt under quality malt in the sack
- Well dried
- Not weevil eaten

The COA – Certificate of Analysis

- Essentially we perform the initial stages of brewing
 - generate a wort □ mill, mash, filter
- Lab scale & lab precision
 - allows for malt to malt comparison



Why Use your COAs?

- Knowledgeable product procurement
- Improve consistency
- Predict process adjustments pro-actively rather than reactively
- Improve efficiencies – learn your systems ideal target ranges
 - Maybe your focused on the artistry and less interested in efficiency...
 - Saving time/money in process allows more flexibility for \$ on higher quality ingredients
- Improved communication with your maltster
 - Dial in to what your really after!

Know your Distillery

You can't know if something has changed if you're not tracking

- Good malt aspects to track per brand:
 - Intake – assortment, moisture, dust/chaff, sensory
 - Malt COA values
 - Grist analysis, Mash pH, Lauter times, gravities & yield
- When there is an issue quantifying it informs the solution!

Available Download: Excel Tracking File for Malt:

<https://www.montana.edu/barleybreeding/learning-center/maltster-resources/Maltster-Resources.html>

Typical COA Parameters

Endosperm Modification:

- Extracts (Fine, Coarse, F-C)
- β -Glucan
- Friability
- Filtration time

Protein Modification:

- Total protein
- Soluble protein
- FAN
- S/T

Enzymatic Potential:

- α -amylase
- Diastatic Power

Other tests:

Color – product of kilning and level of modification (sugars/amino acids)

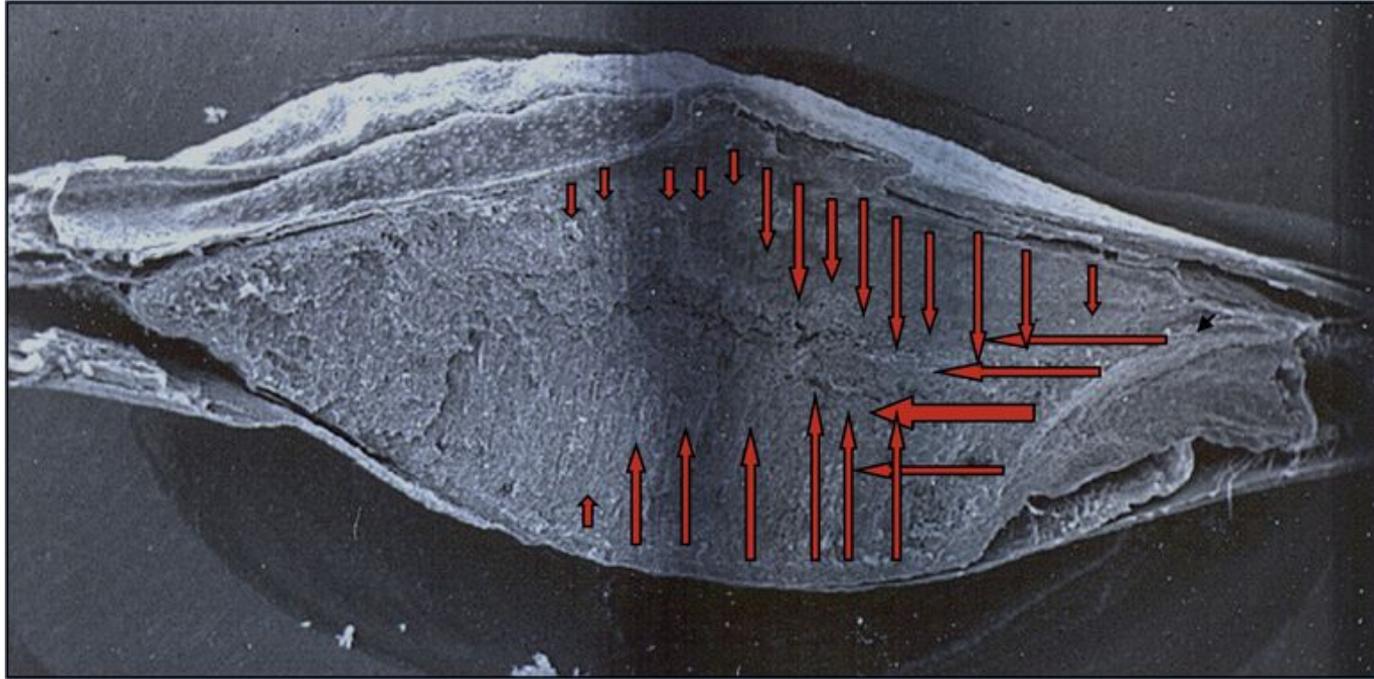
Moisture – kilning efficiency – important for processing and storage

pH – can be telling about malting process – asphyxiated grain becomes acidic

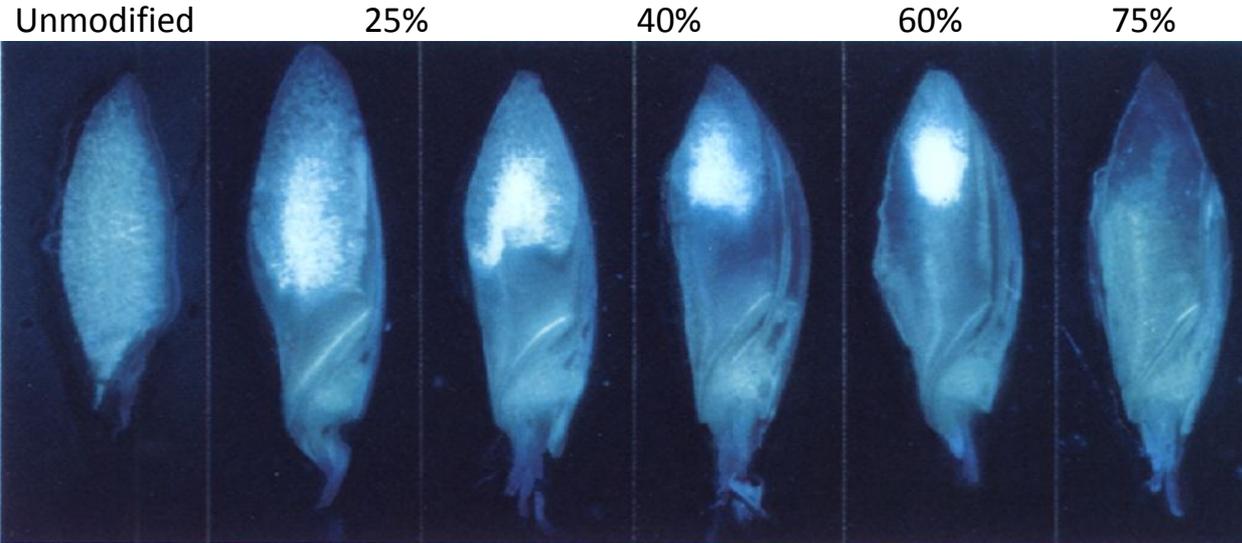
Analysis is vulnerable if you look at any one test in isolation – together they tell the full story!

Quality Evaluations Measure the Level of Endosperm Modification

Goal: achieve good cell wall breakdown without excessive protein solubilization and starch degradation



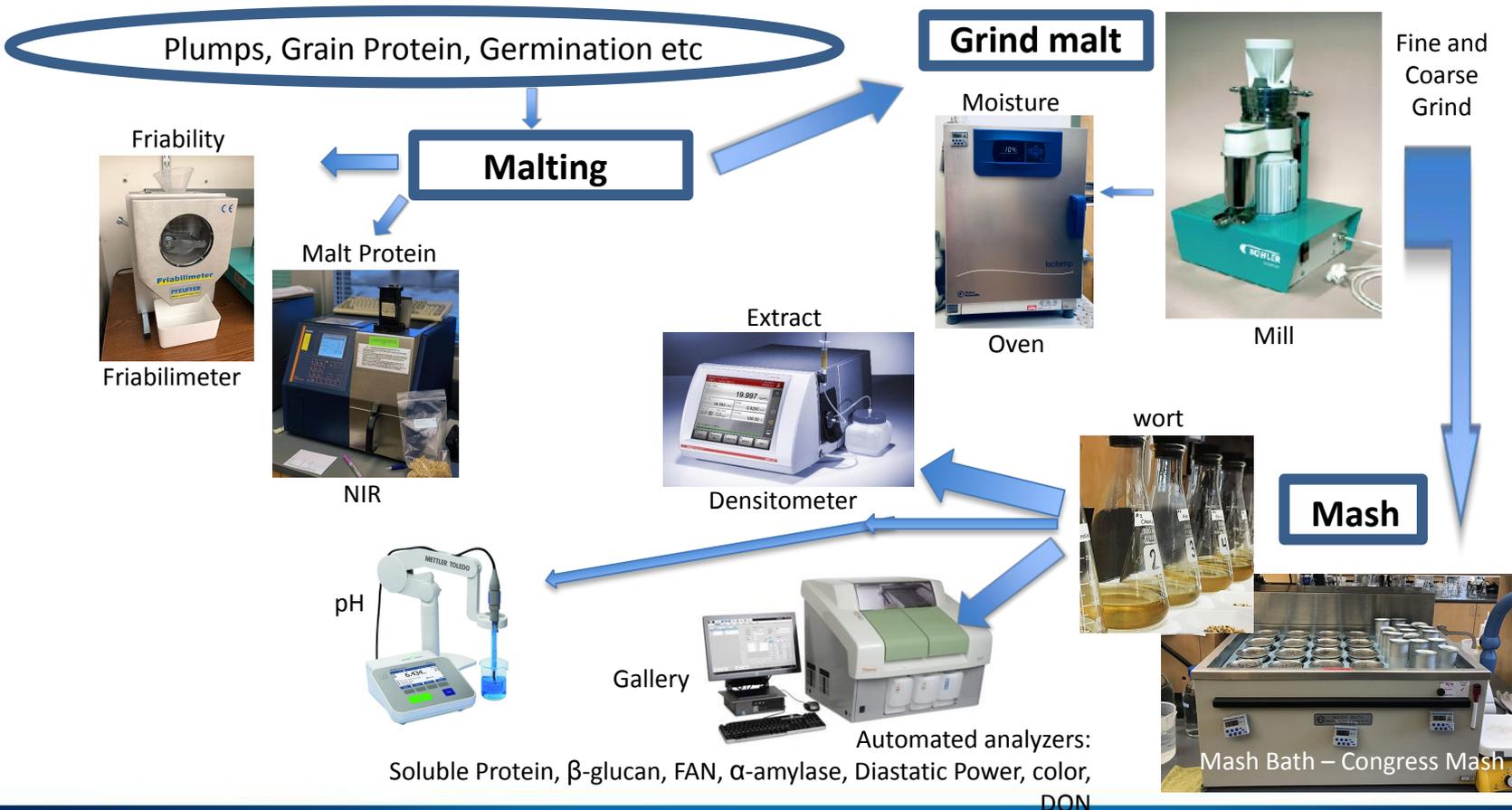
Endosperm Modification



Calcofluor (reacts to highlight β -glucan) stained seeds demonstrate modification

S. Aastrup & K. Erdal: Quantitative determination of modification, Carlsberg Res. Commun. Vol. 45, p 369-379, 1980

Malt Quality Analysis Flow Chart



- Typical needs -

American Malting Barley Association

	All Malt Brewing/Distilling	Grain Distilling
Total Protein (%)	<11.5%	11 - 13.5%
Extract (%)	>81.0%	>79%
Soluble/Total Protein (%)	38-45%	>48%
β -Glucan (ppm)	<100	...
FAN	150-180	>250
Diastatic Power ($^{\circ}$ L)	100-120	>200

ASBC Methods for COA Production



THE SCIENCE OF BEER

AMERICAN SOCIETY OF
BREWING CHEMISTS



ASBC Validated methods that are standard for North American malt, barley & cereal grain testing.

asbcnet.org

Friability

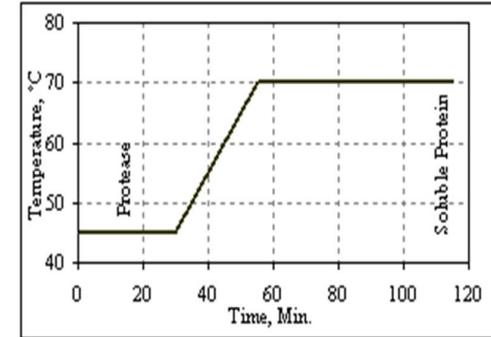
- Tests how easily the malt crumbles
- Malt is crushed against a sieve drum –
 - well modified portions press through / poorly modified portions held within
- Friable portions is expressed as a % -- typically well modified malt is >80%
- Measure impacted by barley protein, variety, malting process, moisture etc

ASBC/MSU Collaborative Video
detailing the friability test

Find it in our learning center:
[Montana.edu/barleybreeding/learning-center](https://montana.edu/barleybreeding/learning-center)

Standard Laboratory Mash – Congress Mash

- Water added, 8:1 water to grist ratio
- Automated water bath
 - Precise time and temperature control
 - Continuous stirring

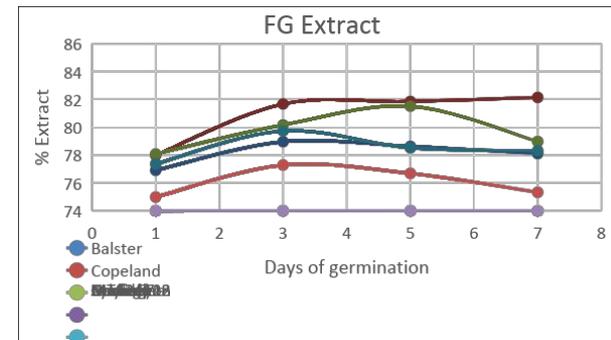
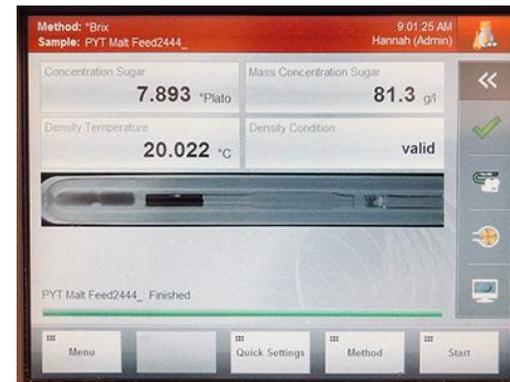


Filtration to Produce a Wort



Malt Extract

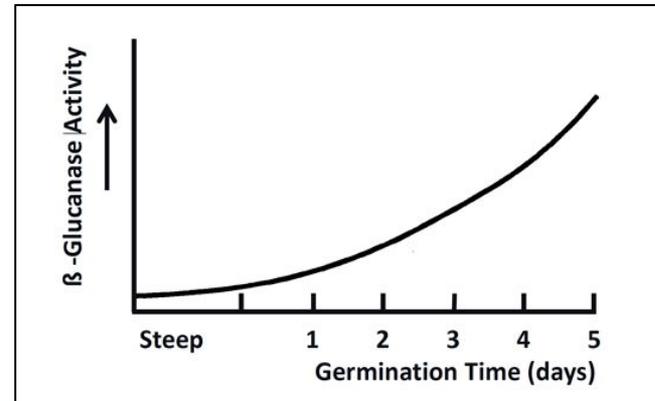
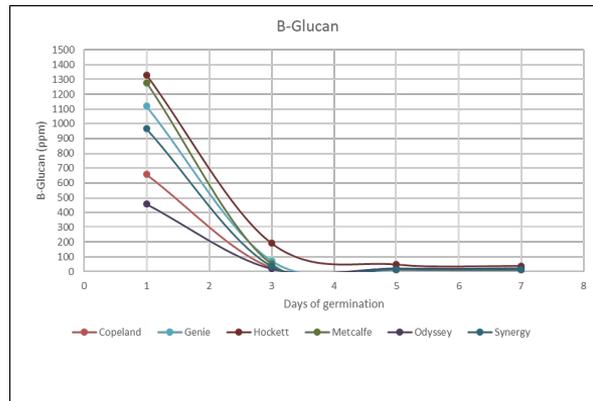
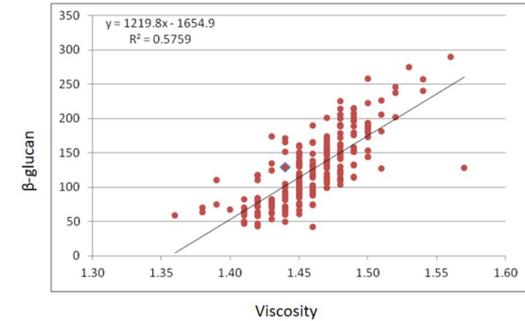
- Total soluble content of the malt, expressed as a percent of malt weight
- Primarily carbohydrates, but also soluble proteins, amino acids etc.
- Highly precise measure –
- Importance
 - Related to brewhouse yield
 - Negatively correlated to protein
- Specifications
 - Two-row > 80%, fine grind dry basis
 - Six-row > 78%, fine grind dry basis



 β -Glucan

North American six-row malt

- Measure of residual cell wall components in wort
- Low levels indicate good endosperm modification
- High levels caused by poor modification, distal ends, dead kernels
 - lead to problems with lautering and beer filtration
- Specification:
 - <150 mg/L





S/T (Soluble/Total Protein)

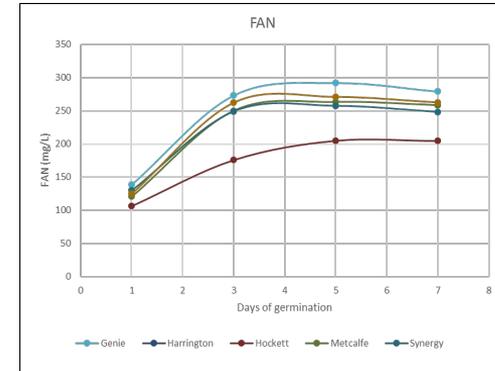
- Ratio of soluble to total protein
- Indicates extent of protein modification
- Specification for balanced modification:
 - 38-45%
 - Too low: problems w/ foam retention
 - Too high: potential clarity problems





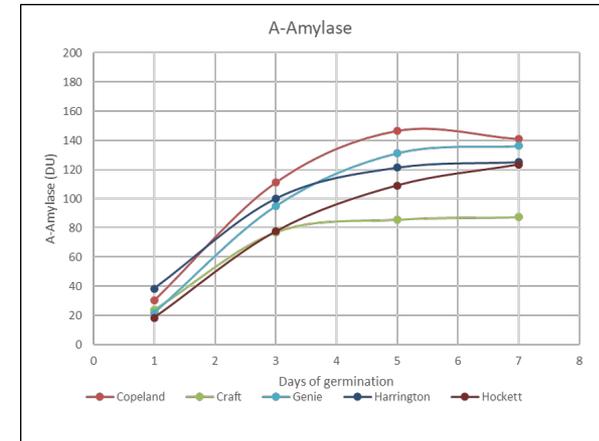
Free Amino Nitrogen (FAN)

- Product of protein breakdown
 - Estimation of total amino acid content
 - amino acids = building blocks of protein
- Required for yeast nutrition
- Low levels desired in products
 - bad for stability/shelf life
 - Some needed for foam/foam stability, contributes to flavor
- Specifications:
 - All malt brewing: >150 mg/L
 - Adjunct brewing: >200 mg/L



 α -amylase

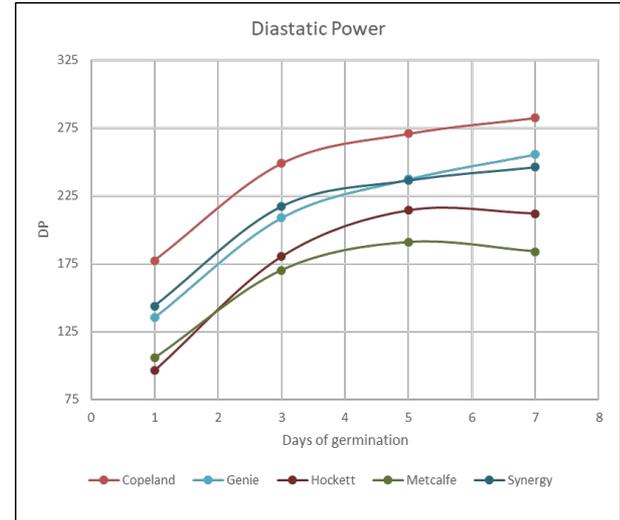
- Important enzyme for degradation of starch during mashing
 - Produced during malting (builds as process progresses)
 - Influenced by variety and malting conditions
 - Specifications:
 - Moderate: 40 – 55 DU (brewer's malt, all malt distillers)
 - High: 55 -70 DU (adjunct brewers)
 - Very High: > 70 DU (distillers)
- Too low can = long conversion times





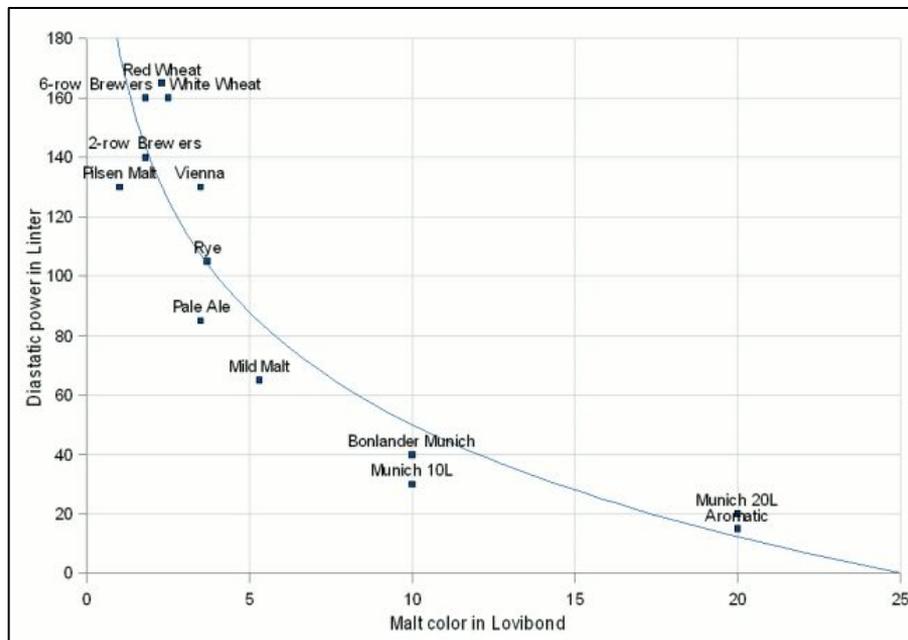
Diastatic Power
Measure of Fermentability

- Represents total activity of starch degrading enzymes
- Largely a measure of β -amylase activity
 - produces small fermentable sugars
- Strongly influenced by variety and protein content
- High kiln temps (particularly w/ higher moisture) can denature β -amylase
- Specification:
 - High: >150 °L
 - Moderate: 125-150 °L
 - Low: < 125 °L



Tradeoff between color/flavor and enzymes

DP



Color & Flavor

Increasing color/flavor = increase in kilning diastatic enzymes denatured

- larger effect on DP than α -amylase

Quality Analysis - Analytical Variation

Test	Within Lab (r_{95})	Between Labs (R_{95})
	repeatability	reproducibility
Moisture (%)	0.2	0.8
Extract (%)	0.4	1.4
Friability (%)	3.0	7.0
Color (°SRM)	0.2	0.5
Diastatic Power (°L)	10	30
Alpha Amylase (DU)	5	15
FAN (mg/L)	7	40
β -Glucan (mg/L)	20	50
S. Protein	0.2	0.64
S/T	1.5	6.3

Oppositional Specs

- Low moisture with high DP
- Low moisture with low color
- Low color and very high soluble protein
- High FAN and low soluble protein
- Low total protein and high enzymes
- High total protein and high extract
- High friability and high moisture

COA Interpretation

ID	Analysis Type	Moisture	Friability	Un-modified	Whole Kernel	Extract	Color	B-Glucan	Soluble	Total	S/T	FAN	Diastatic	Alpha	Filtration	Turbidity	pH
	Full or					FGDB			Protein	Protein			Power	Amylase			
	Basic	%	%	%	%	%	°SRM	mg/L	%	%	%	mg/L	°L	D.U.	Time	NTU	
1118-0243	B	4.61	91.0	3.40	2.90	82.7	2.47	281	4.18	10.3	40.7%	139	71	44.8	normal	7.41	5.78
1118-0343	B	4.16	93.5	1.40	0.42	81.9	4.00	178	4.24	10.0	42.2%	134	54	39.3	normal	6.58	5.69
0128-0843	B	4.28	91.7	3.94	3.58	82.8	2.22	252	4.08	9.9	41.3%	142	81	30.5	normal	6.68	5.72
1218-0453	B	5.37	88.3	3.84	3.36	82.8	1.57	290	3.89	9.9	39.3%	146	93	31.7	normal	8.58	5.77
1218-0543	B	4.25	82.8	2.08	0.76	80.7	2.81	177	4.48	12.0	37.4%	152	86	47.9	normal	4.75	5.76
	Correlations		Friability	Un-modified	Whole Kernel	Extract	Color	B-Glucan	Soluble	Total	S/T	FAN	Diastatic	Alpha	Filtration	Turbidity	pH
	Moisture	0.01	0.36	0.35	0.26	0.58	0.58	0.56	0.12	0.07	0.05	0.36	0.16	...	0.64	0.37	
	Friability		0.01	0.05	0.46	0.08	0.05	0.22	0.75	0.98	0.92	0.45	0.22	...	0.24	0.31	
	un-modified			0.98	0.57	0.83	0.82	0.52	0.21	0.00	0.03	0.41	0.34	...	0.37	0.25	
	Whole Kernel				0.70	0.73	0.86	0.60	0.32	0.01	0.00	0.29	0.41	...	0.46	0.18	
	Extract					0.25	0.73	0.78	0.82	0.33	0.25	0.00	0.49	...	0.77	0.01	
	Color						0.67	0.38	0.03	0.16	0.25	0.77	0.20	...	0.27	0.49	
	B-Glucan							0.64	0.33	0.01	0.00	0.20	0.23	...	0.69	0.34	
	Soluble Protein								0.72	0.12	0.07	0.08	0.73	...	0.87	0.01	
	Total Protein									0.63	0.52	0.06	0.61	...	0.66	0.09	
	S/T										0.93	0.54	0.17	...	0.13	0.42	
	FAN											0.70	0.05	...	0.13	0.32	
	Diastatic Power												0.06	...	0.02	0.42	
	a-amylase													...	0.39	0.09	
	Filtration														
	Turbidity															0.06	

Conclusions

- The Craft Maltsters Guild offers many educational resources and benefits
- Craft Malt can be an extension of your Craft Beverage production
 - Get to know your local maltster!
- Malt COAs can be an important tool for boosting your efficiency and quality
 - Never look at just one result in isolation
 - Track your values and process for best results

- Additional Resources:
 - craftmalting.com
 - montana.edu/barleybreeding
 - Hannah.turner2@montana.edu

Questions
?

A distillery warehouse filled with rows of wooden barrels on metal racks. The barrels are arranged in neat rows, and the racks are made of light-colored wood. The lighting is warm and slightly dim, creating a rustic atmosphere. The text is overlaid in the center of the image.

Jason Parker
Copperworks Distilling
Seattle, Washington