



www.brewersassociation.org

The Search for a Public Malting Barley Variety Better Suited for All Malt Brewing

**...and lessons we all learned
along the way**

“You cannot conduct a modern community except with an adequate supply of persons upon whose education, whether humane, technical, or scientific, much time and money have been spent.”



- Winston Churchill

Objectives

- **Brewers Association**
- Barley End User Needs
- BA White Paper
- Gaps and Bridges
- -065 Project



Brewers Association

~3,815 Members of over 5,400 U.S. Breweries

- 19 Competitive grants in support of research in sustainability & raw materials in 2017 (12 in barley, 7 in hops)

In barley:

- \$328k Total (\$9k - \$59k, \$27.3k avg)
- 10 States including NC, NE, VA, VT
- 5 Breeding / Variety Development
- 3 Sustainability
- 2 Malt Flavor Origins; 11 Flavor Results

**** Joined BMBRI in April 2016**



Malt Consumption by U.S. Brewers

2016 U.S. Brewer Malt Consumption and Production				
Brewer Type	Volume Share	Consumption Share	Production (U.S. BBLs)	Malt Consumption (U.S. Pounds)
Craft High Rate	15%	40%	25,762,244	1,769,866,196
Other High Rate	2%	6%	3,582,825	246,140,078
Medium Rate	2%	3%	3,270,000	117,720,000
Low Rate (Adjunct)	81%	52%	141,488,931	2,334,567,354
Total	100%	100%	174,104,000	4,468,293,627

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Drinkers: Barley End Users

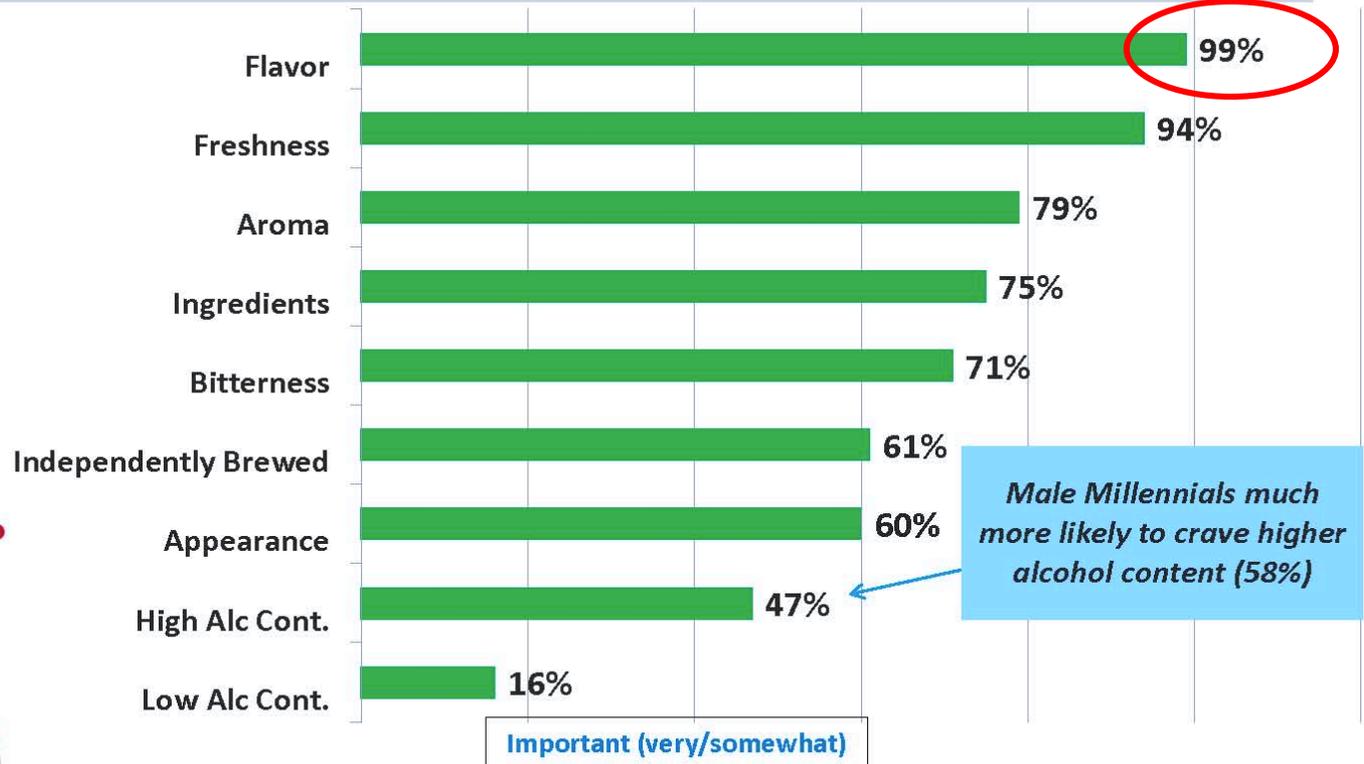


Beer Drinker Deciders

FLAVOR & FRESHNESS LEAD WHEN IT COMES TO CHOOSING A CRAFT BEER (IN GENERAL)

While Flavor & Freshness lead, Craft consumers are looking for much more....

How important are each of the following when choosing a craft beer to purchase?



Source: Nielsen's Craft Beer Insights Poll (CIP) conducted May 2015 by Harris Poll (n=1,014 Craft Drinkers/n=590 weekly craft drinkers)

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2014 BA White Paper



EXECUTIVE SUMMARY

The brewing industry is evolving rapidly, and the barley malt supply chain should likewise evolve rapidly to meet the very different needs of all-malt beer brewers. Brewers Association member craft brewers have identified malt supply mismatch as a potential impediment to growing their brands. To produce all-malt beer brands, craft brewers seek barley malts with

- > distinctive flavors and aromas
- > lower free amino nitrogen ("FAN")
- > lower Total Protein
- > lower Diastatic Power ("DP")
- > lower Kolbach Index (ratio of Soluble Protein to Total Protein, or "S/T")

Such malts differ significantly from the current suite of available barley malts produced in North America. The demand for such malts will grow significantly as craft production increases.

INTRODUCTION

The U.S. brewing industry is currently undergoing profound and lasting structural change. Craft brewers are changing the face of the industry at all levels: retail, wholesale, production and supply. As of March 2014 there are over 2,800 breweries operating in the U.S., likely producing over 10,000 beer brands. This diversity presents challenges as well as opportunities for wholesalers and retailers, and unprecedented choice for consumers. The U.S. beer market is arguably the most diverse in the world.

In July 2012, Brewers Association staff attended a North Dakota-based barley field course offered by the Institute of Barley and Malt Sciences (IBMS) and North Dakota State University (NDSU). Brewers Association staff learned that U.S. craft brewers were already using over 20% of all malt consumed by U.S. brewers, belying their relatively small production share (at that time, around 6% of U.S. beer production). In response, barley grower and North Dakota Barley Council Chair Doyle Lentz replied "then craft brewers better figure out how to communicate with growers."

The Brewers Association couldn't agree more. This paper is offered in the spirit of communication with and by growers, academics, breeders, maltsters, dealers and brewers, and all other barley and malting industry stakeholders. These collected ideas and perspectives represent a single snapshot in time of an incredibly complex industry that continues to evolve rapidly.

RECENT HISTORY AND CURRENT STATUS OF BREWING AND MALTING INDUSTRIES

During the middle half of the 20th century (1930s to 1990s) the U.S. beer market was generally characterized by -

- Increased product homogeneity and dominance of adjunct lager styles
- Decreasing number of brewing companies via attrition and consolidation
- Increasing dominance of a relatively small number of brands of adjunct lagers
- Slowly decreasing original gravities
- Relatively homogenous barley malt needs

During this time breeders made important advances in yield, disease/stress tolerance, extract and digestibility - attributes that yielded high quality malt for a growing brewing industry. Nonetheless, prior to the advent of craft brewery companies in the late 1970s and early 1980s, barley growers and the malting industry responded to relatively uniform brewer needs by developing a relatively small number of high diastatic power, high FAN malt varieties suitable for adjunct brewing.

By definition, the malt used to produce beer was nearly all consumed by large producers of adjunct lagers.



2014 BA White Paper

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- **distinctive flavors and aromas**
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2014 BA White Paper – Gaps & Bridges

Gap (2012-2014)	Outcome (2017)
25% U.S. Malting Capacity Shortage by 2020	\$\$\$; Briess, Great Western, Rahr; 61 Craft Maltsters; U.S. Capacity +12%
Commercial or 3 rd Party Malt Quality Labs (0)	Hartwick College, MI St Univ, MT St Univ, OR St Univ
Pilot Malting Facilities (0 U.S.)	Briess, OR St Univ, Rahr
Malt Sensory Validated Method (0)	ASBC Hot Steep Method; CMG Malt Ambassadors
Understanding Genetic Origins of Barley and Malt Flavor By Variety	Genetics (OR St Univ): 12 loci and counting
Measuring Barley, Malt and Beer Flavor Components	Metabolomics (CO St Univ)
Malt Sensory Lexicon	Ongoing; 500+ terms and counting
Malting Barley Varieties w/ lower Protein, DP, FAN	Ongoing; -065 Project; USDA, University & Private Seed Co. Breeding (2)

Understanding Barley Flavor: Malt Sensory Evaluation



Images courtesy Cassie Liscomb/Briess Malt & Ingredients



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Malting Barley Variety Commercialization: -065 Project

Program Assumptions

1. Flavor is one of many important deciders of malt quality
2. New barley varieties must confer an advantage to many stakeholders –
 - Growers: Yield, Management Costs
 - Maltsters: Malthouse Performance
 - Brewers: Extract Potential, Flavor Acceptance



Malting Barley Variety Commercialization: -065 Project

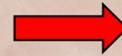
A Multi-Year, Highly Collaborative Process:

- USDA-ARS Breeder
- University Researchers: Malt Quality, Plant Pathology, Metabolomics, Genetics & Pilot Malting
- Commercial Maltster
- 7 Craft Brewers

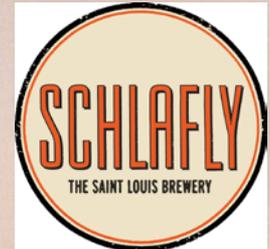
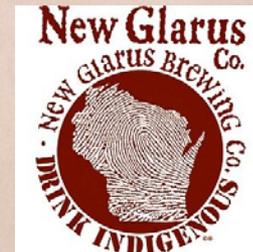
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USDA Agricultural Research Service



NDSU NORTH DAKOTA STATE UNIVERSITY





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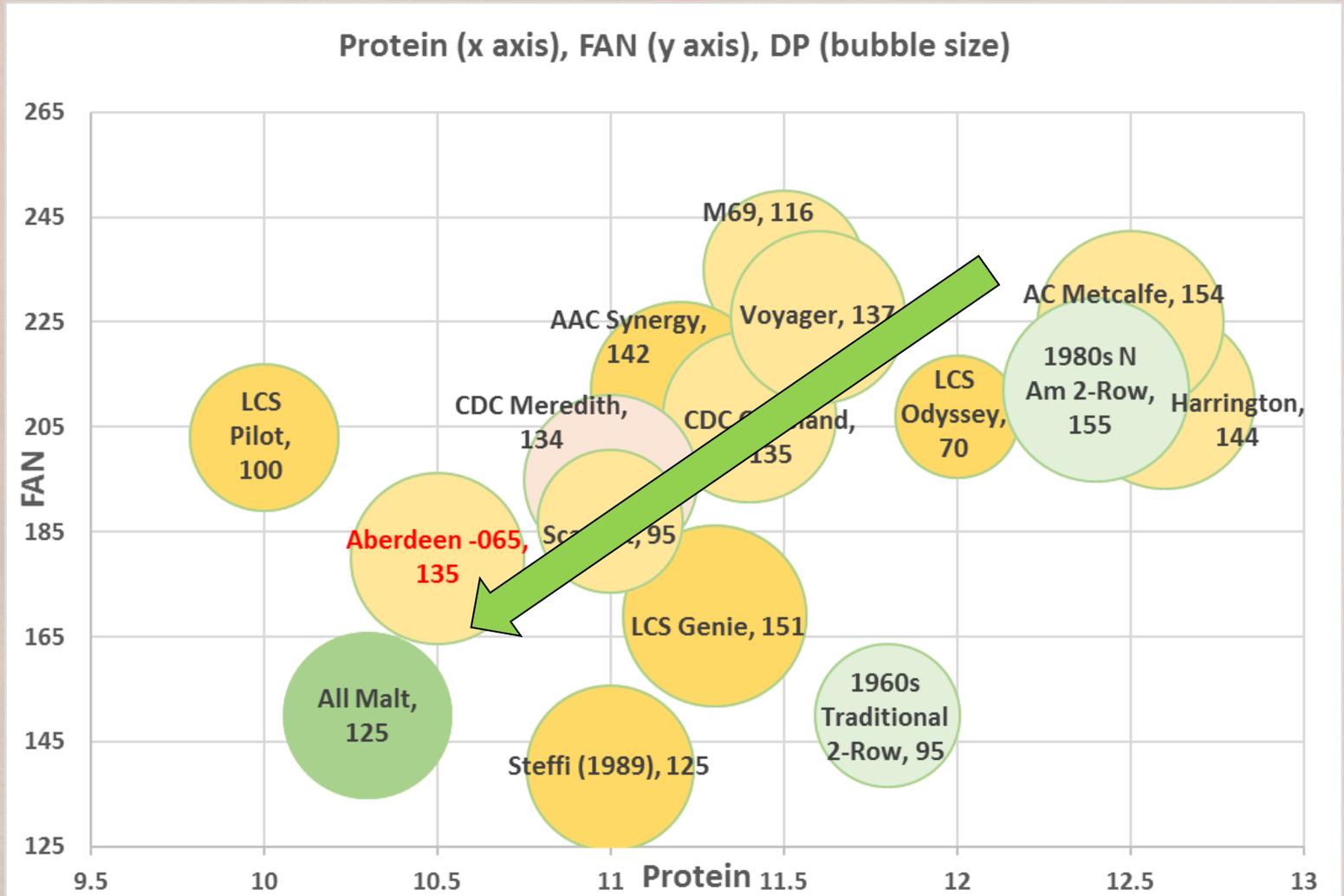
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Image courtesy Pat Hayes and OSU Barley Project



The Evolving N American Barley Variety Basket





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