**August 2015 Flavor Report**

Dustin Herb, Patrick Hayes, and the OSU Barley Project

Dustin will be leaving August 18th for internships at Rahr Malting Co. in Shakopee, MN and Valley Malt in Hadley, MA. During this period, Dustin will be immersed in the malting industry and gain insight into the day-to-day operation of a commercial and craft malthouse. His experience will include hands-on malting with various systems as well as malt analysis, nano-brewing, beer analytics, and sensory. The knowledge and skillset acquired will benefit him in his future career and the OSU malt lab.

In addition, Dustin will be furthering research of the OSU Barley Project. Below are the details of Dustin’s activities at both Rahr Malting and Valley Malt.

***Institution:*** Rahr Malting Co.

***Objective:*** Determine the barley contributions to beer flavor: discovery of the underlying genetic mechanisms controlling barley flavor from a Quantitative Trait Loci (QTL) mapping population derived from a cross between Full Pint x Golden Promise.

* Micro-malt 125 replicated selected samples from the Oregon Promise mapping population.
	+ 51 samples from Corvallis, OR: 49 agronomic & random samples and 2 parents
	+ 35 agronomic samples and 2 parents from Lebanon, OR
	+ 35 agronomic samples and 2 parents from Madras, OR
* Perform malt analysis on micro-malted samples
* Nano-brew malt samples
* Gas chromatography/ mass spectrometry analysis of nano-brewed beer samples
* Panelist sensory evaluation of nano-brewed beer samples

This subset will help develop the assay for high-throughput phenotyping of barley samples in order to accurately create a flavor profile for this population. Results will validate and complement findings in the full population.

***Outcomes:*** Results derived from this internship will be published in a peer-reviewed journal and presented at the 2016 American Society for Brewing Chemists annual meeting in Denver, Colorado.

***Institution:*** Valley Malts

***Objective:***

* Valley Malts research project…
* Learn design and engineering of malting equipment
* Learn malt analysis procedures at Harwick College
* Difference in malting and flavor between drum and floor malting?
* Understand New England agronomics and barley production
* Evaluate OSU winter-facultative & low temperature tolerance trial in Massachusetts and New York.
* Oregon State University barley contributions to beer flavor project

***Oregon Promise – Preliminary Nano-brew results***

Dan Carey and crew (New Glarus Brewing Co.) are nano-brewing selected Oregon Promise doubled haploids (derived from the cross of Full Pint x Golden Promise). The malts were made by Chris Martens at the USDA Cereal Crops Research Unit (Madison, WI). Here are data on the nano-brews thus far (Table 1)...

***First, the stars of the show:***

Sample 5700 (120058) - Nice Foam, Clean, Smooth - Best "American" Type

* Agronomic performance: Barley Stripe Rust (0%), Leaf Rust (3%), Moderate Maturity, Denso dwarfing gene
* Malt Quality: Ext (80.6%), DP (133), FAN (190), Wort Color (1.8), S/T (43.4)

Sample 5705 (120031) - Full, Malty, Smooth, Rich, Nice! - Best "Euro" Type

* Agronomic performance: Barley Stripe Rust (20%), Leaf Rust (0%), Moderate Maturity, Denso dwarfing gene
* Malt Quality: Ext (80.1%), DP (120), FAN (240), Wort Color (2.5), S/T (41.1)

Sample 5713 (120322) - Malty, sweet / dry, morish, low color

* Agronomic performance: Barley Stripe Rust (23%), Leaf Rust (5%), Moderate Maturity, no dwarfing gene
* Malt Quality: Ext (79.1%), DP (134), FAN (167), Wort Color (1.7), S/T (36.8)

Sample 5717 (120331) - Light, clean, malty, sulfur, Euro, juicy, nice

* Agronomic performance: Barley Stripe Rust (13%), Leaf Rust (3%), Moderate Maturity, ari-e dwarfing gene
* Malt Quality: Ext (79.5%), DP (104), FAN (135), Wort Color (1.5), S/T (31.1%)

Sample 5721 (120359) - Wow, malty, biscuit, sweet, candy, floral

* Agronomic performance: Barley Stripe Rust (20%), Leaf Rust (40%), Moderate Maturity, double dwarfing gene (Denso & ari-e)
* Malt Quality: Ext (78.3%), DP (105, FAN (134), Wort Color (1.7), S/T (33.0%)

Sample 5725 (120373) - Coffee! Roasted bitter, "White Stout"?, very unique

* Agronomic performance: Barley Stripe Rust (23%), Leaf Rust (50%), Moderate Maturity, ari-e dwarfing gene
* Malt Quality: Ext (80.9%), DP (106), FAN (230), Wort Color (2.2), S/T (51.3%)

***Honorable mention****:* Samples 5701, 5706, 5707, 5711, and 5719

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| **Table 1. Oregon Promise Selection – New Glarus Brewing Nano-brew Sensory** |
| **Entry** | **Rank** | **Comments** | **DH #** | **Selection** |
| **5700** | 1-1 | Nice Foam, Clean, Smooth - Best "American" Type | 120058 |  Agronomic Selection |
| **5701** | 1-2 | Balanced Malty and Hoppy, Clean, Sweet | 120145 |  Agronomic Selection |
| **5702** | 1-3 | Middle of the Road | 120166 |  Agronomic Selection |
| **5703** | 1-3 | Middle of the Road | 120263 |  Random Selection |
| **5704** | NDC | Flour, Slight Bitter, Dry, Thin | 120020 |  Agronomic Selection |
| **5705** | 1-1 | Full, Malty, Smooth, Rich, Nice! - Best "Euro" Type | 120031 |  Agronomic Selection |
| **5706** | 1-4 | Darkest, Malty, Bready, Very Nice but Slight Grainy | 120089 |  Agronomic Selection |
| **5707** | 1-2 | Best Foam, Sweet, Clean, Mild | 120090 |  Agronomic Selection |
| **5708** | NDC | Thin, Weak, Astringent | 120156 |  Agronomic Selection |
| **5709** | NDC | Grainy, sulfur, mild, sweet / dry | 120185 |  Random Selection |
| **5710** | NDC | Golden color, DMS, middle of the road, thin, poor foam | 120283 |  Random Selection |
| **5711** | 2-2 | Sweet, full, very clean, bread, malt | 120285 |  Agronomic Selection |
| **5712** | NDC | Sulfur, soap, bitter, thin | 120314 |  Agronomic Selection |
| **5713** | 2-1 | Malty, sweet / dry, morish, low color | 120322 |  Random Selection |
| **5714** | NDC | Flour, sweet, slight grainy, bread, malt | 120325 |  Random Selection |
| **5715** | NDC | Light, clean, slight sweet, neutral | 120329 |  Agronomic Selection |
| **5716** | 2-3 | Malty, middle of the road, slight fruity | 120330 |  Agronomic Selection |
| **5717** | 2-1 | Light, clean, malty, sulfur, Euro, juicy, nice | 120331 |  Agronomic Selection |
| **5718** | NDC | Grainy, harsh, low color, DMS | 120338 |  Random Selection |
| **5719** | 2-2 | Sweet, full, bitter after taste, malty, clean | 120341 |  Agronomic Selection |
| **5720** | NDC | Nice foam, full, bitter, sulfur | 120342 |  Random Selection |
| **5721** | 3-1 | Wow, malty, biscuit, sweet, candy, floral | 120359 |  Random Selection |
| **5722** | NDC | Middle of the Road, grainy, malty | 120363 |  Agronomic Selection |
| **5723** | NDC | Middle of the Road, neutral, sweet, slight harsh | 120365 |  Agronomic Selection |
| **5724** | 3-3 | Malty, sulfur, neutral, slight harsh | 120366 |  Agronomic Selection |
| **5725** | 3-1 | Coffee! Roasted bitter, "White Stout"?, very unique | 120373 |  Random Selection |
| **5726** | NDC | Neutral, grainy | 120374 |  Agronomic Selection |
| **5727** | NDC | Sulfur, neutral | 120380 |  Random Selection |
| **5728** | NDC | Sulfur, neutral, harsh | 120381 |  Agronomic Selection |
| **5729** | 3-4 | Biscuit, sulfur, sweet, clean but slight bite | 120384 |  Agronomic Selection |

More data coming, including the parents – thanks Dan & crew at New Glarus Brewing!

***\*\*\*Looking forward to a flavor-filled year\*\*\****