

# Flavor Report August, 2016

Flavor 7-pack members - three things to report on for this month:

1. Keep an eye out for Dustin and his barley contributions to beer flavor poster (#147) at the World Brewing Conference. Brought to you, by you, and Rahr Malting.

## 147

**WORLD BREWING CONGRESS 2016**

**The Oregon Promise: A Tool for Understanding the Genetic Mechanisms Regulating the Expression of Flavor Traits in Barley (*Hordeum vulgare*) Important for Malting, Brewing, and Distilling**

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**World Brewing Congress**  
August 13-17, 2016  
Sheraton Downtown Denver  
Denver, CO 80202, U.S.A.

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**Introduction**

The Oregon Promise is a spring barley population derived from a cross between Golden Promise and a wild barley parent. Golden Promise is an ancient variety for malting, brewing, and distilling developed in Scotland and the United Kingdom. The Oregon Promise is a cross between Golden Promise and a wild barley parent. The Oregon Promise is a cross between Golden Promise and a wild barley parent. The Oregon Promise is a cross between Golden Promise and a wild barley parent.

**Materials & Methods**

**Genotyping** - 18 advanced lines selected based on molecular systems, and genotyping data from the Oregon Promise is presented. The Oregon Promise is a cross between Golden Promise and a wild barley parent. The Oregon Promise is a cross between Golden Promise and a wild barley parent.

**Phenotyping** - 18 advanced lines were grown in 2014 in two locations in Willamette Valley (Corvallis, OR & LaGrange, OR) and in one location in Oregon (Hillsboro, OR). Phenotypic data included the following: flowering time, leaf area, yield, height, and grain yield. The Oregon Promise is a cross between Golden Promise and a wild barley parent.

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**Results**

- 18 advanced lines were and significantly affected by genotype (Table 1).
- Significant genotype effects were observed for malting quality and malt quality attributes in Corvallis and Madras (Table 1).
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**Discussion**

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**Figure 1. Principal Component Analysis (PCA) of Oregon Promise and Golden Promise lines. The plot shows the first two principal components (PC1 and PC2) with points representing different lines.**

**Figure 2. Linkage map of the Oregon Promise population and the marker positions of the genome. The map shows chromosomes 1H, 2H, 3H, 4H, 5H, 6H, 7H, and 7L with various markers and trait locations.**

**Figure 3. QTL scan plot for beer flavor. The plot shows the LOD score for each marker across the genome. Significant QTLs are highlighted in red.**

**Figure 4. QTL scan plot for malt quality. The plot shows the LOD score for each marker across the genome. Significant QTLs are highlighted in red.**

**Acknowledgements**

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2. It's been a great summer – and now the final harvest is in the bag. The Oregon Promise plots at Madras were terrific. Data to follow - for now an image.



### 3. What's on tap for the next round of flavor research: July, 2016 – June, 2017

#### The goals:

1. Finish Chapter 1 on Oregon Promise
2. Validate micromalt and nano-brew with pilot malt and pilot brew
3. Moving flavor forward in elite germplasm
4. Higher resolution mapping of flavor genes

#### The funding:

1. Flavor 7-pack (Goals 1, 2, 3)
2. Brewers Association (Goal 4)
3. New donors (to complete the circle with a full-time post-doc)

#### The details:

##### Goal 1

- 2016 crop (Lebanon, Madras, OR; Mt. Vernon, WA)
- Micromalt, nano-brew, nano-brew sensory with Rahr
- Analyze, interpret, and publish – effects of years and locations on flavor
- Oregon Promise variety release decision

##### Goal 2

- 2016 crop (Madras) drill strips ~ 200 lbs each of the most exciting 4 Oregon Promise selections
- Pilot malt (tentatively OSU malt house)
- Pilot brew (tentatively Deschutes research brewery)
- Beer sensory (tentatively all interested Flavor 7-pack members)

##### Goal 3

- In the winter/facultative breeding program we have generated doubled haploids from a range of contemporary and classic barley varieties. Among the latter is Maris Otter.
- These selections are moving forward based on agronomic and malting quality performance – the next step is to get them into nano-brew and pilot brew trials.

##### Goal 4

- See attached Brewers Association proposal

**Many thanks, cheers, and as always – your perspectives, suggestions, and visits much appreciated.**