

Barley Matters...
.....In Beer Flavor (?)
Tis the Seasonal (December 3, 2014)



Icing it down...down on the farm

Taste the Flavor, cheer the season and envision plenty of malt in 2015:

The malting of Oregon-grown Full Pint, Klages, and Copeland at the CMBTC is completed and malt has been shipped to New Glarus (where brewing is in progress) and Sierra Nevada (where brewing will commence next week). There was less malt than we'd hoped for, so there isn't enough for all members to brew with. There will be beers to run through you sensory panels, however, and beers to taste at the Barley Improvement Conference.

When the OSU malt lab is up and running, there will be plenty of malt to go around. That's why we need your help. We have raised \$80,000 of the \$170,000. The big pending request (\$60,000) is with the Brewers Association. If we get the BA grant, we just need to raise \$30,000. If we don't get the BA grant, we'll be back to a grassroots campaign. In any event, we really appreciate your \$5,000 per year support of the flavor project. If you have given all that you can, no worries. But if you can help the malt lab project as well, that would be great.

Todd Bastian, with the OSU Foundation will be following up with you about this special, one-time donation with a suggested amount of \$5,000. Please note – he will also be asking if you can pledge \$5,000 per year for the next 4 years for your continuing support of the flavor project. That would simplify your annual giving to this endeavor and it would help us with assurance of continuity as we move forward. A Malt lab prospectus with an updated budget, starts on page 3 of this report.

We greatly appreciate your consideration of this request, and look forward to the announcement that we've secured the needed funding and are moving forward on the renovations to the lab.

And speaking of numbers.....

Check out these pilot malting results from doubled haploids derived from the cross of Maris Otter/Full Pint. A flavor double play? Time will tell, and quickly when we have the malt lab! And by the way, what is that 85.3 malt extract elephant in the room????

	on	Barley	Malt			Barley	Wort			Alpha-	Beta-			
Variety/Selection	(%)	(Agtron)	(%)	Color	Clarity	(%)	(%)	(%)	(*ASBC)	(20°DU)	(ppm)	(ppm)	Score	Pedigree
DH120276	94.2	41	80.9	2.1	1	11.8	4.91	44.8	146	94.9	60	207	62	MarisOtter/FullPint
DH120143	93.8	37	80.7	3.2	1	11.2	5.07	47.0	117	78.7	106	260	60	MarisOtter/FullPint
DH120175	96.7	35	82.1	2.2	1	9.7	4.58	49.6	150	100.8	51	227	59	MarisOtter/FullPint
DH120178	96.0	37	81.5	2.1	1	10.6	5.29	50.4	167	92.8	49	255	59	MarisOtter/FullPint
DH120201	95.3	45	82.8	2.2	1	10.3	5.07	50.6	156	96.0	55	247	59	MarisOtter/FullPint
DH120203	96.2	38	80.8	2.3	1	11.5	5.64	50.6	186	93.7	63	266	58	MarisOtter/FullPint
DH120204	94.6	45	81.2	1.8	1	9.5	4.13	43.4	76	57.0	154	187	44	MarisOtter/FullPint
DH120206	92.5	41	82.8	2.4	1	10.0	5.27	55.1	114	88.1	34	268	54	MarisOtter/FullPint
DH120304	95.9	49	81.4	2.6	1	10.3	5.61	56.4	130	85.8	46	295	56	MarisOtter/FullPint
DH120182	90.2	41	80.3	2.2	1	11.6	5.46	49.2	144	91.6	113	262	55	MarisOtter/FullPint
DH120200	90.5	54	81.0	1.5	1	9.5	3.63	39.8	71	52.6	106	143	32	MarisOtter/FullPint
DH120243	96.2	40	80.5	1.9	1	11.7	4.59	39.5	171	69.7	111	210	57	MarisOtter/FullPint
FullPint	93.6	42	80.6	2.1	1	10.7	4.74	44.5	195	110.6	122	249	55	Fall-planted-mini-plot
MarisOtter	86.8	51	81.8	1.8	1	9.2	3.81	44.7	67	39.7	130	148	28	Fall-planted-mini-plot
10.0969	94.5	27	85.3	2.0	1	11.6	3.86	33.8	88	38.0	202	112	31	KW2-849/Luca/Waxbar/Luca8
HARRINGTON/MALTCHECK	96.8	74	82.0	2.0	1	11.7	4.99	45.0	107	85.8	125	230	59	CCRUnationalStandard

The 3 x 3 Project: Just in from New Glarus

You'll remember that Dan Carey and his group were doing nano-brews from the same malts that Tom Nielsen and his crew did wort analyses on. Full Pint, Klages, and Metcalfe (plus Harrington in Dan's case). The full New Glarus report is appended to this document (after the malt lab prospectus). Here are some highlights from that report.

“Results indicate that malt flavor appear to be influenced by the following ranked in order of importance: 1. Malting Process; 2. Barley Variety; 3. Growing Region

The four test varieties are similar in flavor. Specific tasting notes can be found in the attached full report. In general, nano-brewed beers made from micromalted barleys are inferior to those nano-brewed from commercially malted barley.

- 1. Full Pint was preferred over the other three test varieties. Tasting notes indicate: Good drinkability; European type character with typical graininess; Fairly neutral.*
- 2. Metcalfe and Harrington were “middle of the road” with acceptable flavor.*
- 3. Klages does not warrant further breeding as it did not have any extra value over the other varieties.”*

All of us at the Oregon Barley Project wish you all a wonderful holiday season and look forward to a flavorful 2015 and beyond

The OSU Malt Lab - Prospectus

Rationale:

There is increasing appreciation for the contributions that different barley varieties, and growing environments, can make to beer flavor. Clearly, barley production practices, the malting process, the maltster, and the brewer all make critical contributions to beer flavor. However, if the genetic architecture of a barley variety and the interactions of this architecture with the environment can make important contributions to flavor, this presents opportunities to create new beers with new markets. It will also allow breeders to be more efficient in breeding varieties with specific flavor profiles. Capitalizing on these opportunities will require building a pipeline from grain to glass, with a key step being the making of malt. There is currently a gap between micro-malting and industrial production. The proposed facility will assist in closing this gap.

We are proposing the establishment of a facility at OSU to produce research pilot malts from 100 – 300 lbs of grain in order to produce sufficient malt for making research beers using typical pilot brewing facilities. Beers made in these pilot plants will be more representative of actual production beers. The pilot malt lab will, once operating, be available to the brewing community on a cost-recovery basis. Malts can be used for brewing experimental beers in the OSU Fermentation Sciences Pilot Brewing facility or by brewer cooperators. The OSU Fermentation Sciences program also has the downstream capabilities of sensory analysis and flavor chemistry.

We built a pilot malting unit (<http://osuminimalter.weebly.com/>) designed to produce 100 – 300 lbs. of malt – via a partnership between the OSU Barley Project, the OSU Fermentation Sciences program, and the OSU School of Mechanical, Industrial, and Manufacturing Engineering. Pending development of a dedicated space for operating the unit, it is on loan to Grain Millers, Inc., a local company interested in developing methods for sprouting grain. Grain Millers has implemented the final modifications needed for optimum moisture and temperature control and will return the unit to OSU in January of 2015. A suitable space for the mini-malter, with requisite steam, water, drainage, and ventilation has been assigned to the OSU Barley Project and Fermentation Sciences program. The estimate for remodeling this space, provided by the CAS architect Lowell Fausett, is \$110,000.

Objectives:

Our objectives are to create the OSU Malt Lab and demonstrate its utility for research and teaching. We will update the mini-malter website and provide open-source access to design and construction information. In addition to the remodeling costs, we are budgeting for the purchase of equipment for malt analysis, the production of test malts, the analysis of test malts, and test brews at OSU. Our rationale for developing capacity for malt analysis is to be able to integrate malting and malt analysis into the research and training programs in Barley Breeding and Fermentation Science at OSU.

Deliverables, Outcomes, and Impacts:

Deliverables will be: an operating malt facility, access to malting unit design and construction data, pilot malts, and pilot beers. These deliverables will lead to the target outcome of a facility for producing research malts in sufficient quantities for the brewing community to assess barley variety and environment contributions to beer flavor.

The anticipated impacts include: rigorous definition of the contributions of barley varieties to beer flavor, the establishment of a process for flavor early in the barley variety development process, and the development of new and novel beers with exciting flavor profiles. As has been demonstrated for the wine industry, development of unique flavor profiles yields marketing opportunities (niche and broader markets), greater sales volumes and higher valued crops.

Budgets:

Expenses

Renovation and remodeling	\$110,000
Malt analysis equipment	\$30,000
Installation of malt unit	\$10,000
Pilot runs, brews, and analyses	\$20,000
Total	\$170,000

Income

OSU Building Use Credits application	\$30,000 - committed
Crop and Soil Science/ Fermentation Science	\$15,000 - committed
Crop and Soil Science royalty funds	\$10,000 - committed
Brewer's Association grants program application	\$60,000 - pending
Carl Casale donation	\$25,000 - committed
Fund raising in progress with OSU Foundation	\$30,000 - pending
Total	\$170,000

For more information, please contact:

- Dr. Patrick Hayes, Barley Project, Dept. of Crop and Soil Science, Oregon State University; 541-737-5878; patrick.m.hayes@oregonstate.edu
- Dr. Tom Shellhammer, Fermentation Science, Dept. of Food Science and Technology, Oregon State University; 541-737-9308; tom.shellhammer@oregonstate.edu
- Scott Fisk, Barley Project, Dept. of Crop and Soil Science, Oregon State University; 541-737-2912; scott.fisk2@oregonstate.edu
- Jeff Clawson, Fermentation Science, Dept. of Food Science and Technology, Oregon State University; 541-737-5680; jeff.clawson@oregonstate.edu