

Select Ingredients

State of The Brewing Ingredient Industry

Peter Hoey | BSG CraftBrewing | 05.23.17

California Craft Brewers Association Spring Conference

Agenda

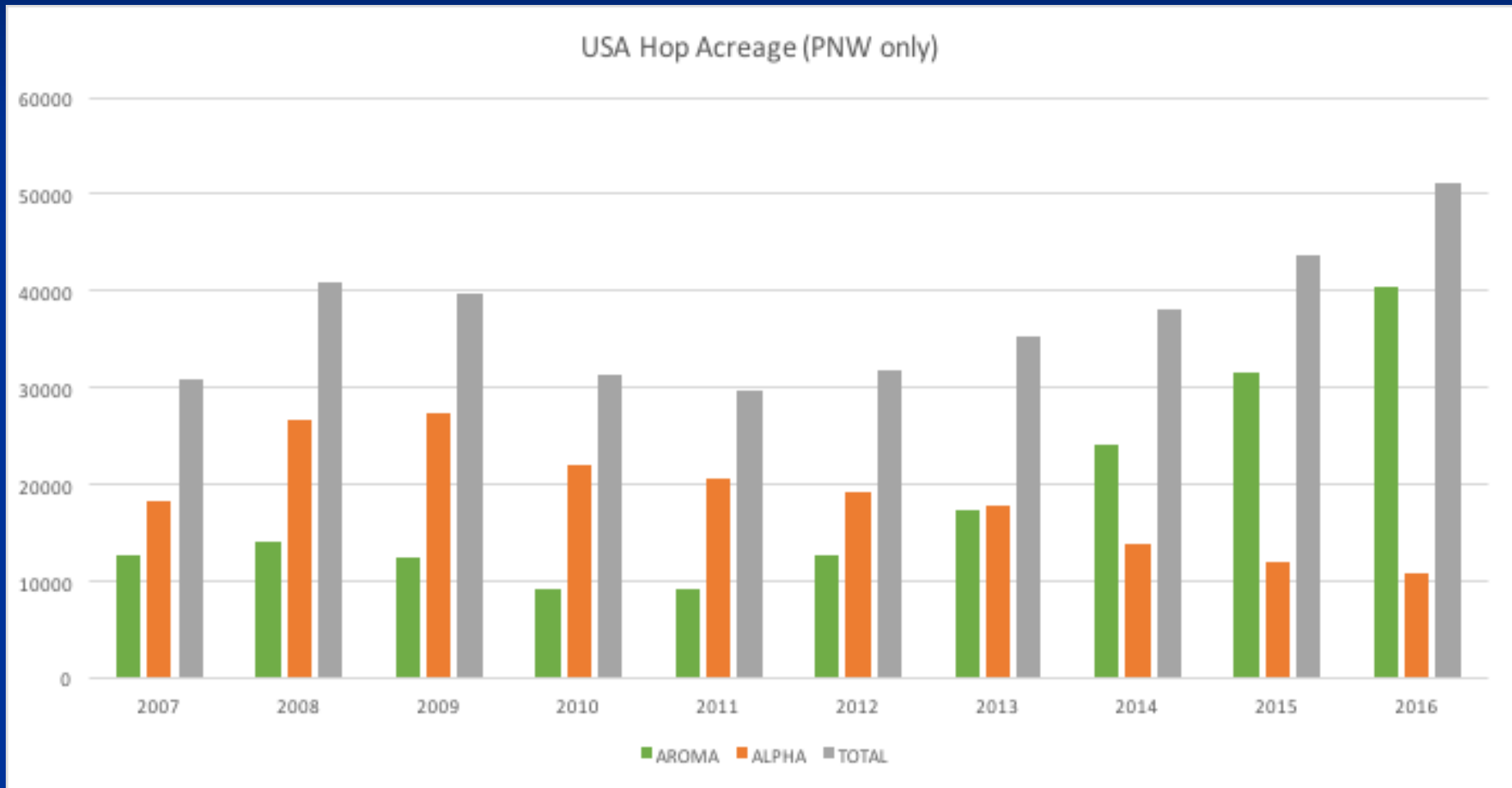
- Hop Acreage 2016
- Hop Crop Report 2016
- Changes in the US Hop Market
- World Barley Update Crop 2016



U.S. Hop Acreage 2016

- Craft brewers needs continue to impact the acreage in the U.S.
 - **Aroma** acreage now 78% of total US hop acreage
 - Varieties seeing the largest increase are Citra®, Simcoe®, and Mosaic®
 - Amarillo® also increased although amount not known as not reported to the USDA
 - Largest decline is CTZ (-822 acres)
 - *Total US hop acreage 53,213 highest on record (45,000 in 1915)*

U.S. Hop Acreage Alpha vs Aroma



Source: USDA

German Hop Acreage 2016

- Acreage increased about 4.2%
- Production was up nearly 51% vs mainly due to a disastrous harvest in crop year 2015
- Germany is major source of alpha for the world market, there is still an alpha deficit world wide
- German growers continue to introduce new aroma hops in direct response to craft demand

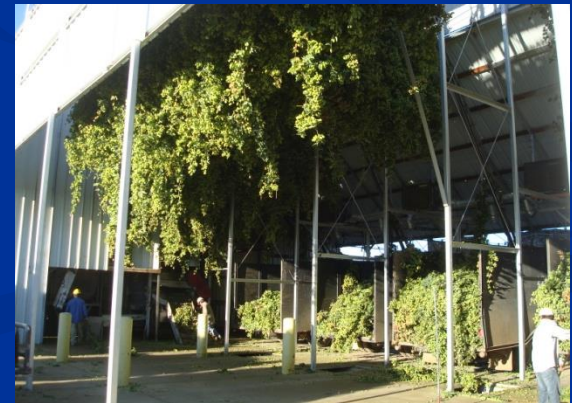
US Crop Report 2016

- A concentrated, hot, early spring
- Carbohydrate reserves in some varieties challenged
- “Normal” summer weather, good for aroma varieties
- Willamette, Centennial, Amarillo yields great. Cascade mixed
- Alpha varieties down slightly
- Aroma profiles are outstanding
- Increased Powdery Mildew affecting later harvested varieties



Changes to the US Hop Industry

- Prior lack of new entry. Now new growers coming on line
- New growing areas for local food source and geographic diversity
- Investment in additional cold storage
- Increased research and breeding programs



2016 Global Malting Barley Highlights

- Modest carry in stocks not replenished last season in fact worsened
- Poor to average growing and harvest conditions in most of EU – France generally poor; UK, Germany, Denmark and rest of Europe average
- Plantings down but largely good growing conditions in the USA resulting in a good crop
- Wet growing conditions in Western Canada – looking at an average crop

2016 European Barley Highlights

- Seeded area up across Europe
- Good start to the growing season in German while wet in the UK and France
- Rain in June washed out French winter crop
- Poor harvest conditions throughout Europe for winter crop
- Poor harvest conditions for French Spring crop, average conditions for rest of Europe
- Yields down across Europe
- Average crop in UK and part of Europe

European 3 Year Comparison

	Acreage			Yield			Production		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
France	1,769	1,829	1,855	6.70	7.09	5.40	11,716	12,393	10,015
Germany	1,573	1,621	1,617	7.35	7.17	6.70	11,658	11,701	10,829
UK	1,080	1,101	1,150	6.51	6.70	6.10	7,009	7,368	7,144
Denmark	604	631	707	5.87	6.10	5.10	3,564	3,633	3,605
Poland	808	839	971	4.03	3.53	3.62	3,256	3,285	3,520
Cz Rep.	350	365	325	5.62	5.44	5.68	1,967	1,995	1,851
EU 28	12,434	12,212	12,562	4.8	4.9	4.7	60,188	60,290	59,747

Area x 1000 Ha, Production x 1000 MT Source Eurostat
Dataset for prior years updated as of Oct 2016

2016 European Quality

- Disappointing quality from France
- Despite the poor state of the winter crop Europe has enough quality barley
- Maltsters looking to UK, Denmark and Spain to cover shortfalls
- Maris Otter produced a high quality crop albeit at a smaller volume
- Good Spring crops will help cover shortfall of winter varieties

2016 US Barley Highlights

- Carry in stocks high due to heavy 2015 crop
- Planting down 16% over 2015
- Harvested acreage down 16%
- Seeding conditions were good – ahead of average
- Good harvest conditions
- Yields up 13% over 2015 to 77.9 bushels per acre

USA 3 Year Comparison

	Seeded			Harvested			Production			2016
	2014	2015	2016	2014	2015	2016	2014	2015	2016	
Minnesota	75	135	95	60	120	79	3,120	9,240	5,514	120
N Dakota	620	1,120	740	535	1,050	640	35,845	67,200	42,880	934
S. Dakota	28	37	(NA)	17	19	(NA)	884	703	(N/A)	(N/A)
Montana	920	990	990	770	860	780	44,660	44,720	46,800	1,019
Idaho	600	610	600	550	580	580	51,700	56,260	62,060	1,352
Colorado	57	65	79	54	63	74	6,696	8,190	9,546	208
Wyoming	85	100	95	68	86	82	7,276	8,170	7,872	171
Washington	115	115	110	105	105	93	6,300	5,040	7,161	156
California	80	80	80	25	29	55	1,825	1,595	4,125	90
Oregon	50	49	45	38	37	32	1,900	1,924	2,144	47
Other	401	322	218	275	210	143	21,336	15,145	11,180	243
Total	3,031	3,623	3,052	2,497	3,158	2,558	181,542	218,187	199,282	4,340
Area x 1000 acres Production x 1000 Bushels Source USDA As of Sept 30 th 2016										MT x 1000

2016 US Barley Quality

- Slightly lower protein in Western crop
- Similar total protein in Midwest 2-Row and 6-Row
- Excellent modification
- Slightly lower enzymatic activity
- Slightly higher extract
- Similar sizing to 2015 crop

2016 Canadian Barley Highlights

- Seeded acreage down slightly
- Dry start to the season, seeding completed early
- Rain arrived in mid-May just in time
- Above average precipitation in July & August
- Fair harvest conditions
- Yields better than 2014 & 2015 crops
- Limited pre-sprout damage but better than 2015
- Crop quality on the whole is better than 2015

Canadian 3 Year Comparison

Canadian barley areas and production 2014,2015 and 2016

	Harvested			Production			Yield		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Alberta	1,141	1,161	1,133	4,131	4,289	4,483	3.6	3.7	4.0
Manitoba	107	148	134	355	566	495	3.3	3.8	3.7
Saskatchewan	745	898	935	2,173	2,863	3,277	2.9	3.2	3.5
Total Canada	2,136	2,354	2,337	7,119	8,226	8,704	3.3	3.5	3.7

Area x 1000 Ha Production x 1000MT Source Statcan

2016 Canadian Barley Quality

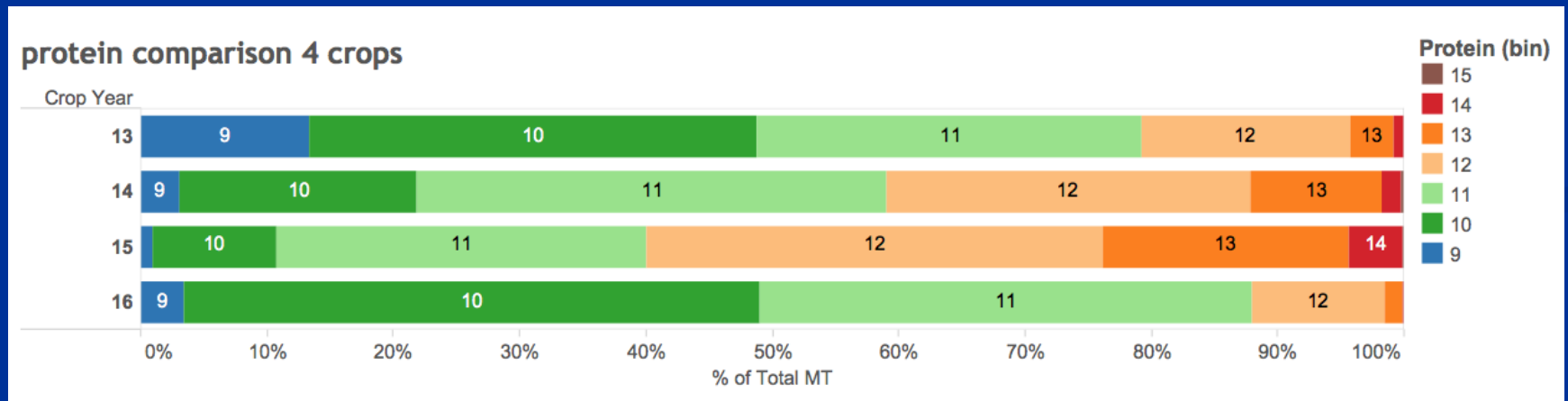
- Sprout damage generally lower than 2015 crop
- Careful selection required for maltsters sourcing in Saskatchewan and Manitoba due to wet conditions incubating fusarium
- Protein down an average of 0.4-0.08% from 2015 crop (Ave 11.5%)
- Plump levels slightly lower than 2015 (93.5%)
- Lower FAN and soluble protein
- Lower wort color due to lower TP and FAN
- Lower enzymatic activity
- Higher extract

Rahr 4 Year Barley Analysis

Crop 13-14-15-16 comparison by year

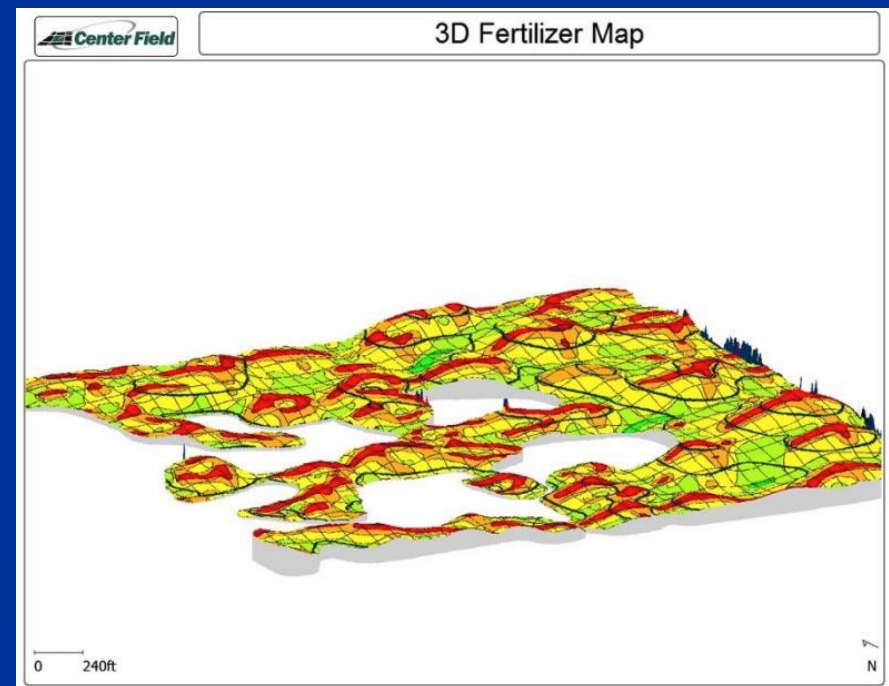
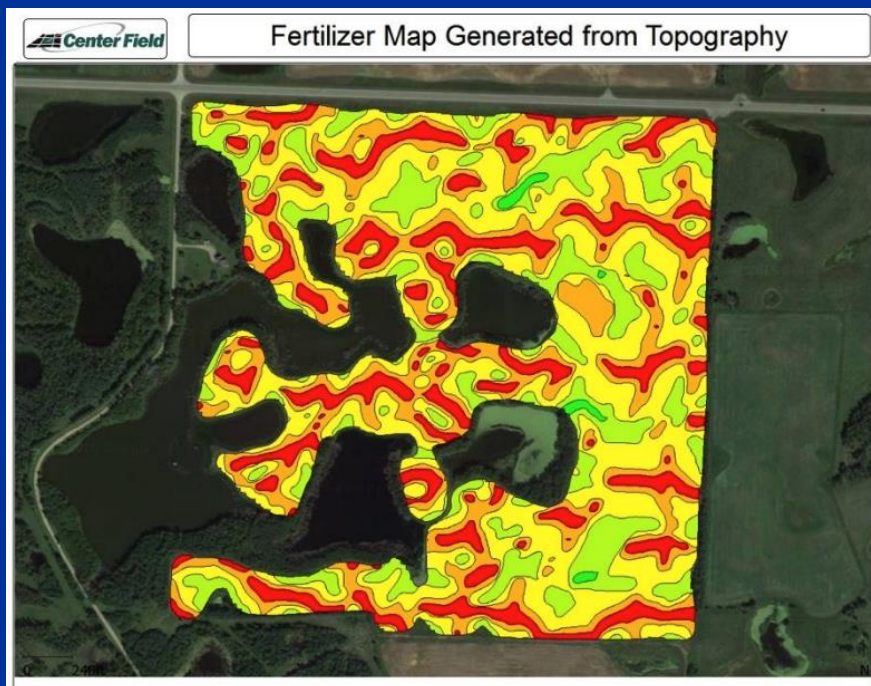


Rahr 4 Year Barley Analysis



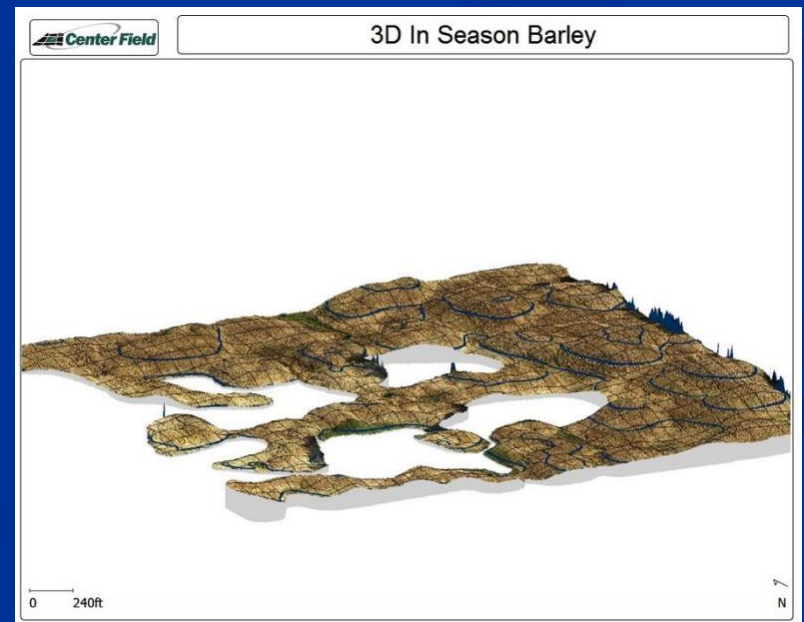
Technological Advances In Farming

- Farmers are getting better yields from the less acreage
- Use of drones and GPS guided seeding and harvesting
- This allows specific application of fertilizer to areas that need it and passing over areas that do not



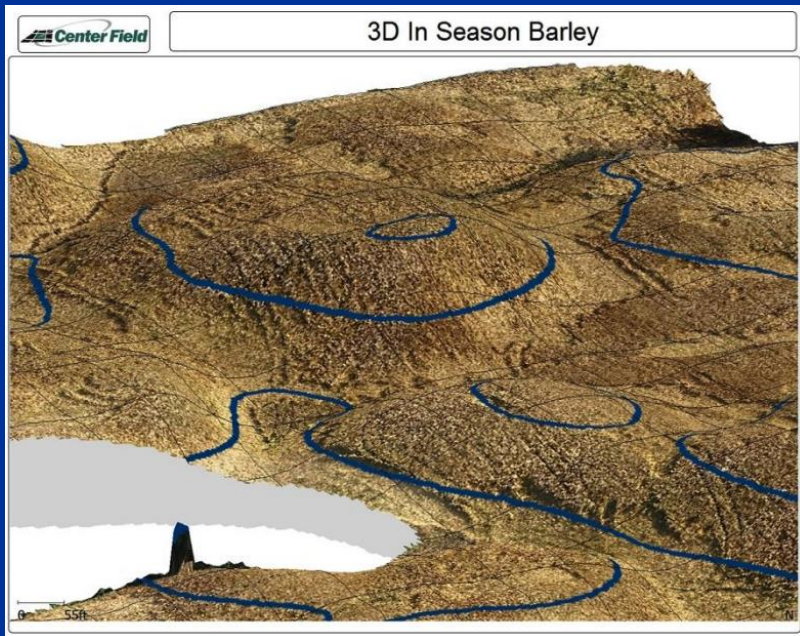
Technological Advances In Farming

- Drones can be flown through the season looking for plant disease
- The optical equipment can sense disease 7-10 days prior to humans and action can be taken to combat it
- Crop protection product application – herbicides and fungicides can be applied only as required and where required



Technological Advances In Farming

- Drones use just prior to harvest can map where the crop has overgrown and fallen. This data can be used to adjust fertilizer application rates for future crops
- Harvest Equipment is also GPS equipped and measures yields on the go to create a map for future crops



2016 World Barley Conclusions

- Poor to average conditions in malting barley regions of Europe, especially France
- Good conditions and yields in the USA
- Wet conditions in Canada giving an average crop with some concerns
- Expect lower proteins and beta glucans from 2016 Canadian crop versus 2015.
- Expect a rapid transition to 2016 crop due to low stocks and better barley in new harvest

A wide-angle photograph of a vast, golden wheat field stretching to the horizon. The wheat stalks are ripe and densely packed, with some heads clearly visible in the foreground. The sky is a vibrant blue, filled with soft, white cumulus clouds. The overall scene is bright and sunny, suggesting a clear day in late summer or early autumn.

Questions?



Thank You!

Special thanks to the following people who helped tremendously with this presentation:

Ian Ward, BSG CraftBrewing

**Bob Sutton, Paul Kramer, Rebecca Jennings, Ronald Volpi,
and Lorne Campbell, Rahr Malting Co.**

Bob King from Crisp Malting Group

Kevin Riel, Double R Ranch