



THE
SCIENCE
OF BEER



2015 ASBC Annual Meeting

June 14-17 ■ La Quinta, California

State of the Global Hop Industry

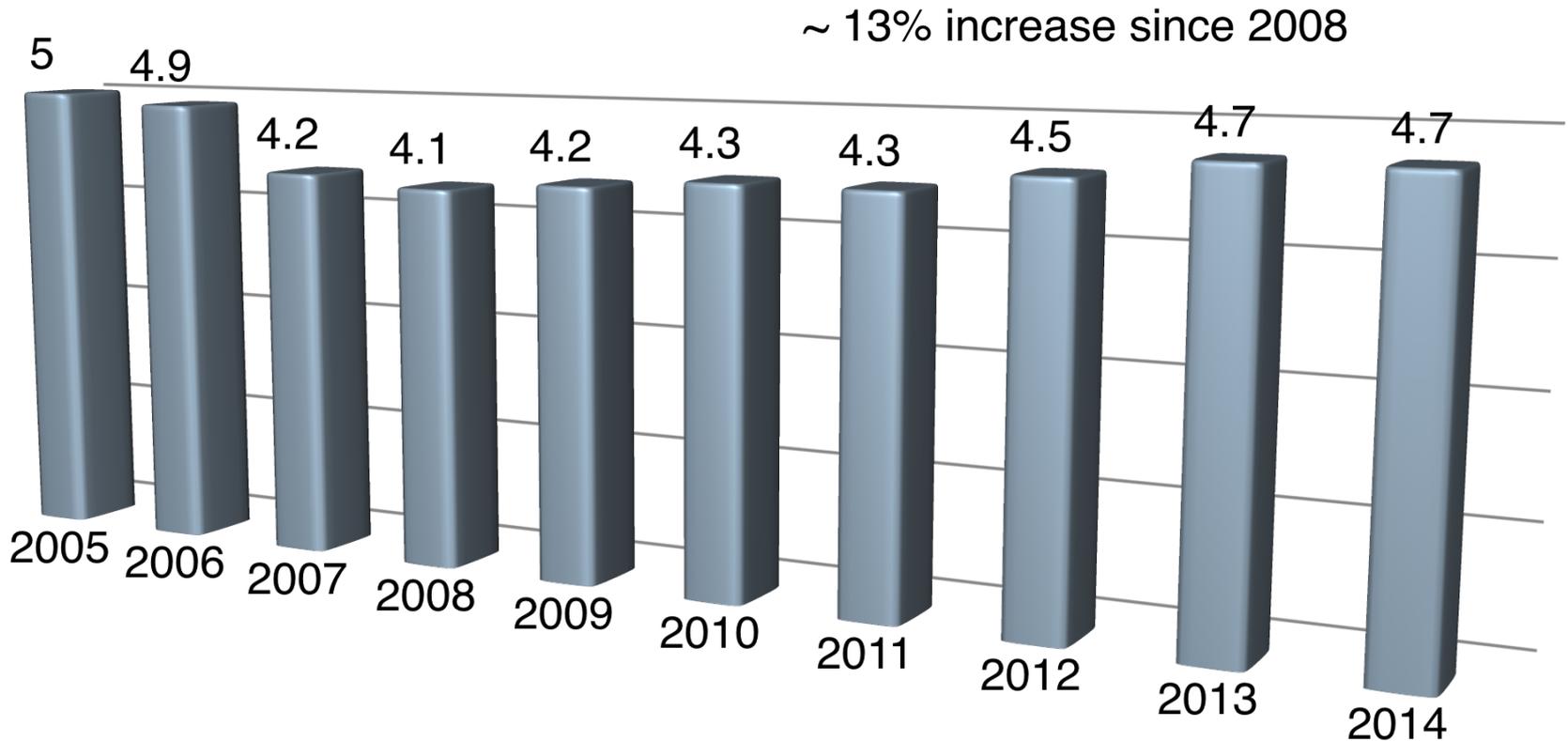
Dr. Christina Schönberger
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Hop Acreage by Country

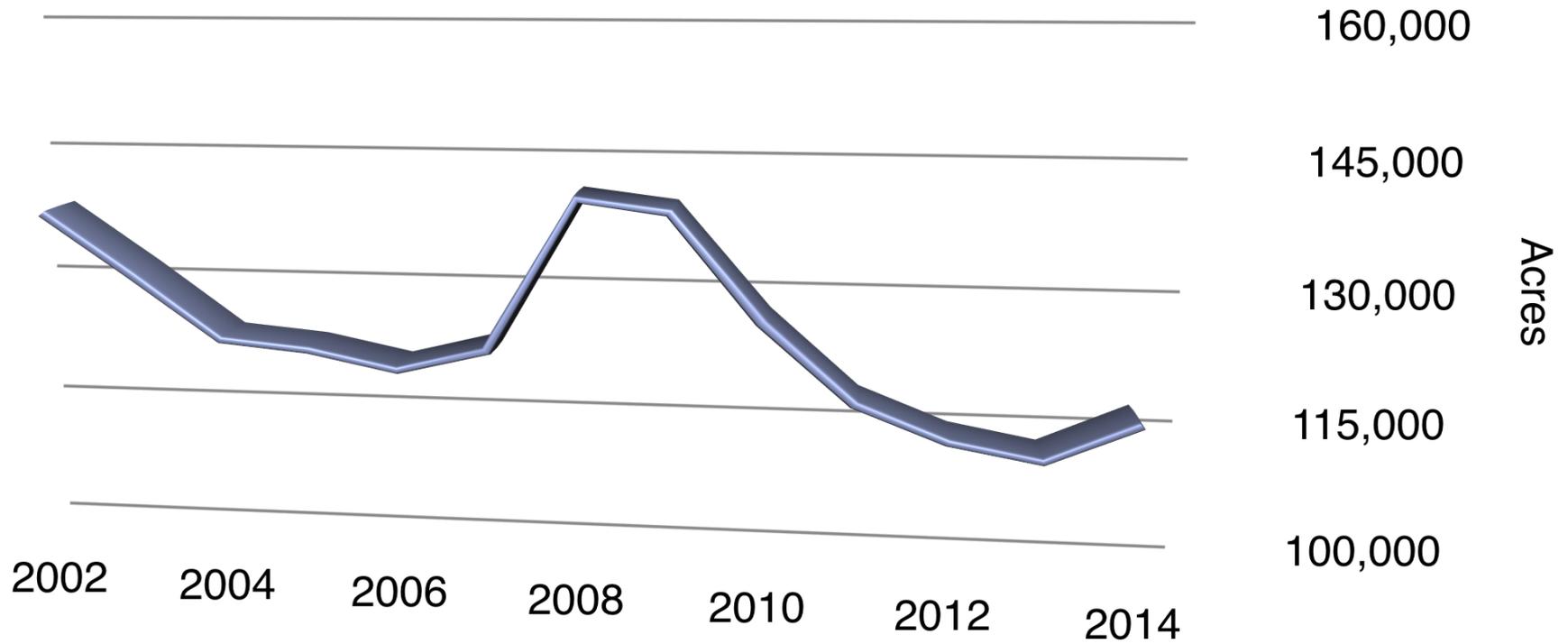
Country	Acres – 2010	Acres - 2014	2014
<i>Germany</i>	44,749	39,782	35.9%
<i>U.S.</i>	31,247	38,011	34.3%
<i>Czech Rep</i>	12,398	10,018	9.0%
<i>China</i>	14,322	6,178	5.6%
<i>Poland</i>	4,369	3,200	2.9%
<i>Slovenia</i>	3,348	2,817	2.5%
<i>UK –</i>	2,642	2,249	2.0%
<i>Spain</i>	1,211	1,285	1.2%
<i>Australia</i>	1,107	1,108	1.0%
<i>South Africa</i>	1,216	1,038	0.9%
<i>New Zealand</i>	939	914	0.8%
<i>World Total</i>	124,242	110,773	

World Hop Demand

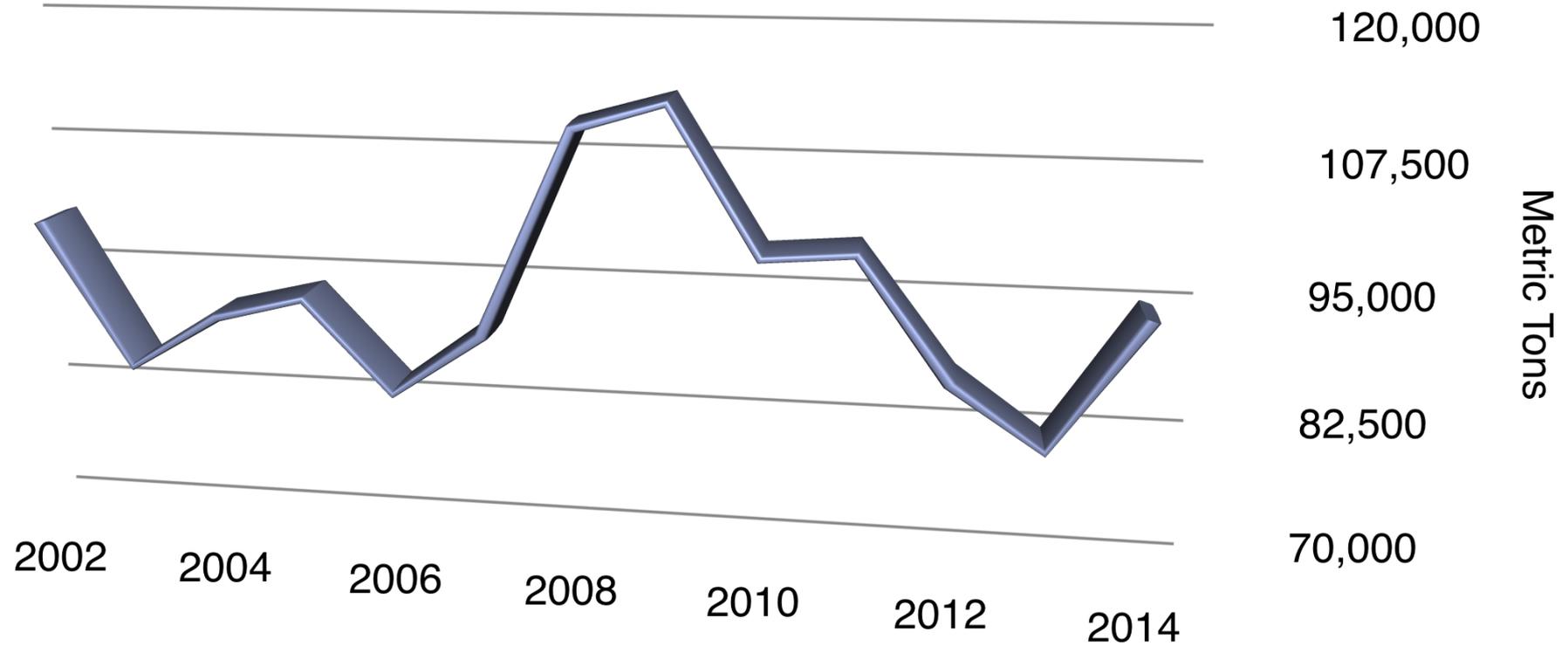


- Global average grams hops per bbl in the last 10 years
- In 2014, world average hops per bbl beer ~ 0.12 lbs.
- In 2014, U.S. Craft brewers average hops per bbl ~ 1.2 lbs

Global Hop Acreage



Global Hop Production – Metric Tons



Flavor Varieties in Germany

Germany	Tons
<i>Saphir</i>	785
<i>Mandarina Bavaria</i>	137
<i>Polaris</i>	130
<i>Hallertau Blanc</i>	61
<i>Hüll Melon</i>	56
<i>Cascade</i>	50
<i>Comet</i>	4
<i>Relax</i>	1
<i>Monroe</i>	0.2

32 Varieties in Germany
2014 crop = 35,000 tons



Czech Republic & France

Czech Republic	Tons
<i>Sladek</i>	538
<i>Agnus</i>	80
<i>Kazbek</i>	36
<i>Saaz Late</i>	30

12 varieties in Czech Rep. (2015)
Total 5,535 tons in 2014

France	Tons
<i>Triskel</i>	36
<i>Bouquier</i>	10
<i>Barbe Rouge</i>	1 to 3

14 varieties in France (2014) France
Total 610 tons in 2014



UK / Australia Flavor Varieties

United Kingdom	Tons
Golding	160
East Kent	151
First Gold	103
Sovereign	53
Boadicea	20
Endeavour	14
Bramling Cross	7
Cascade	5

27 varieties in UK

1,234 tons in 2014.

Term *flavor* not exactly appropriate for English varieties...

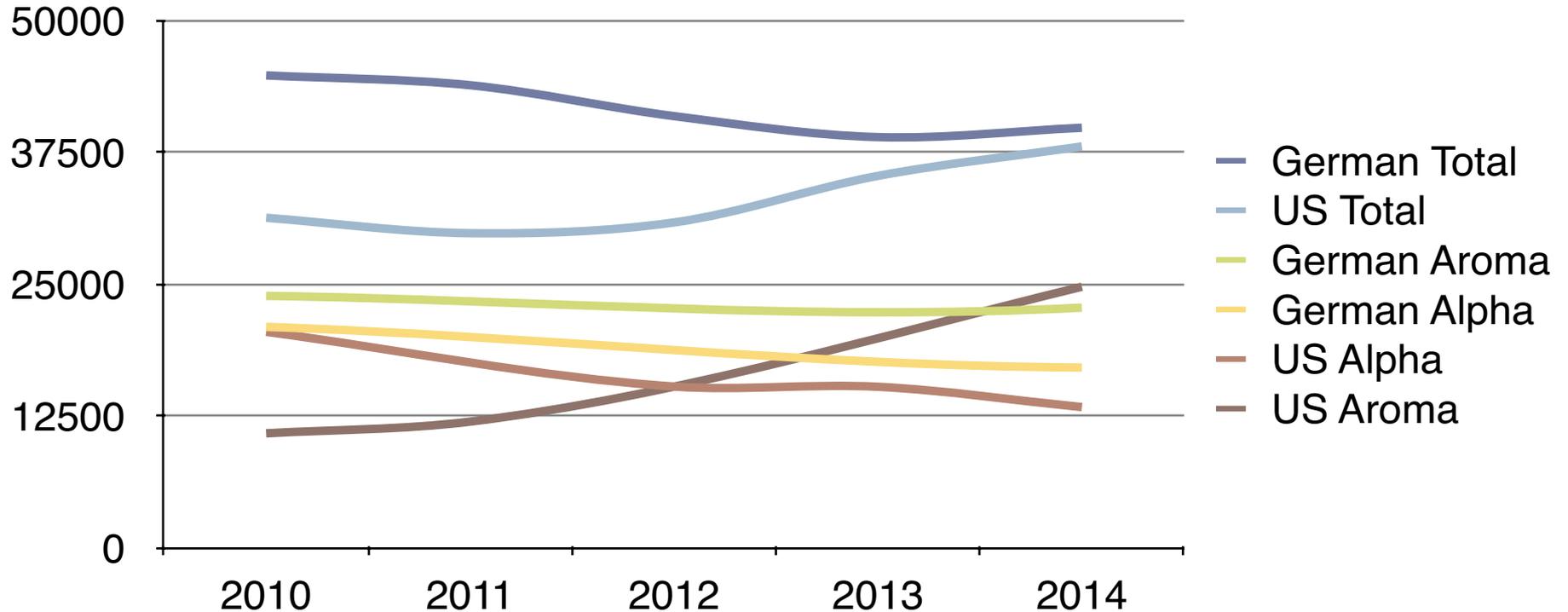


Australia	Tons
Galaxy	450
Topaz	180
Ella	140
Vic Secret	123
Cascade	20
Enigma	6

12 varieties in Australia 2015

1,079 tons in 14 Quasi excl. Flavor varieties!

U.S. and German Hop Acreage



Summary Germany/Europe

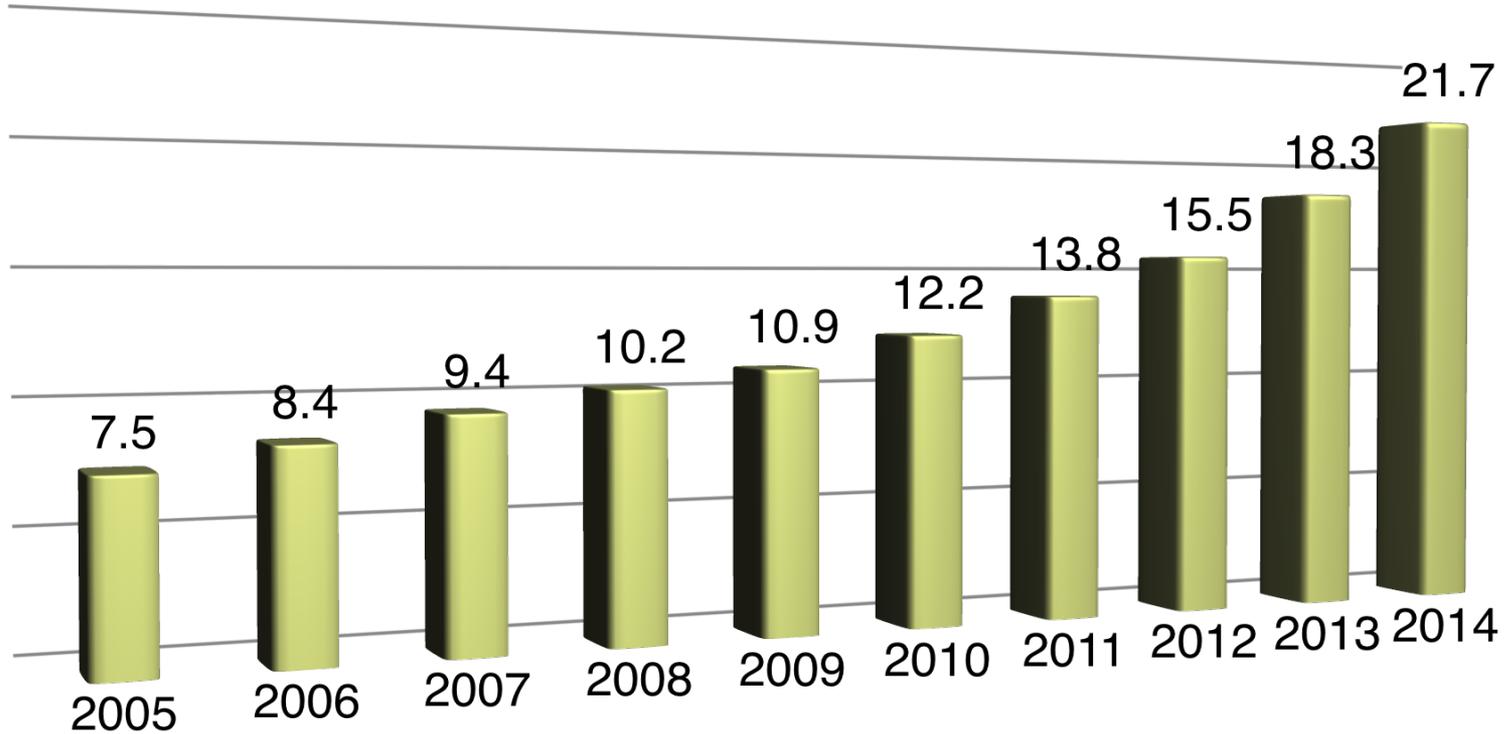
- The craft markets in Europe are small in comparison to the US and tend to be more complex.
- Germany: New breweries emerging and existing breweries are increasing their portfolios with craft-style beers. Mostly small volumes.
- Scandinavia: Booming with a lot of new breweries, new beers and heavy hop loads. – Following US beer styles with small volumes.
- Italy: 1000 breweries!! However, very small. Combination of US craft styles and Belgian beer styles. US hop varieties preferred over others.
- Spain/France/Switzerland/Austria/Czech Rep/Poland/UK
 - Sales handled through channel partners
- Big challenges in making hops in smaller volumes available.

Summary Germany/Europe

- Number of hop varieties available explodes: From 15 up to 50 and more!
- Increased global complexity: e.g. Triskel (French Flavor Hop) for craft brewers in Korea etc.
- Increase in brewers' educational needs for craft and hops.
- New brewers rely much on passion, but not a learned profession for many.
- Strong and varied opinions on hop varieties and hop products.



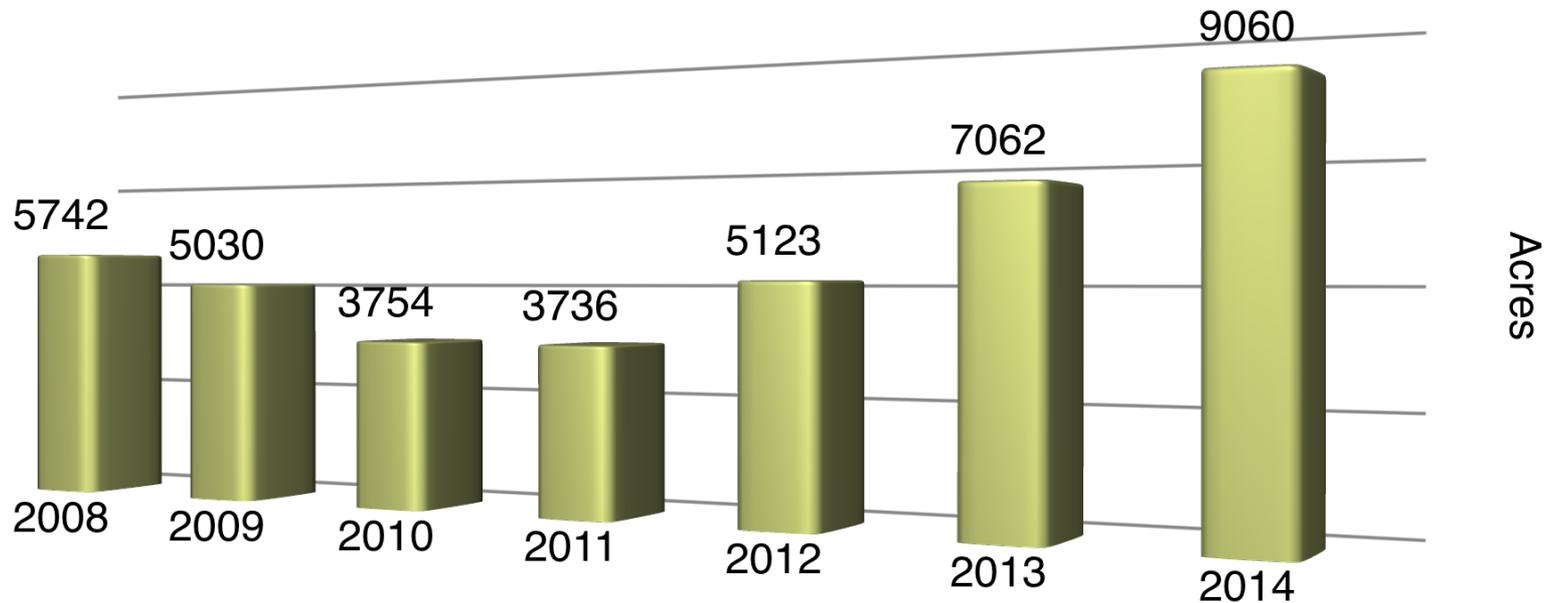
Changes in Hop Demand



- Beer production of US-craft-industry in millions bbls in the last 10 years

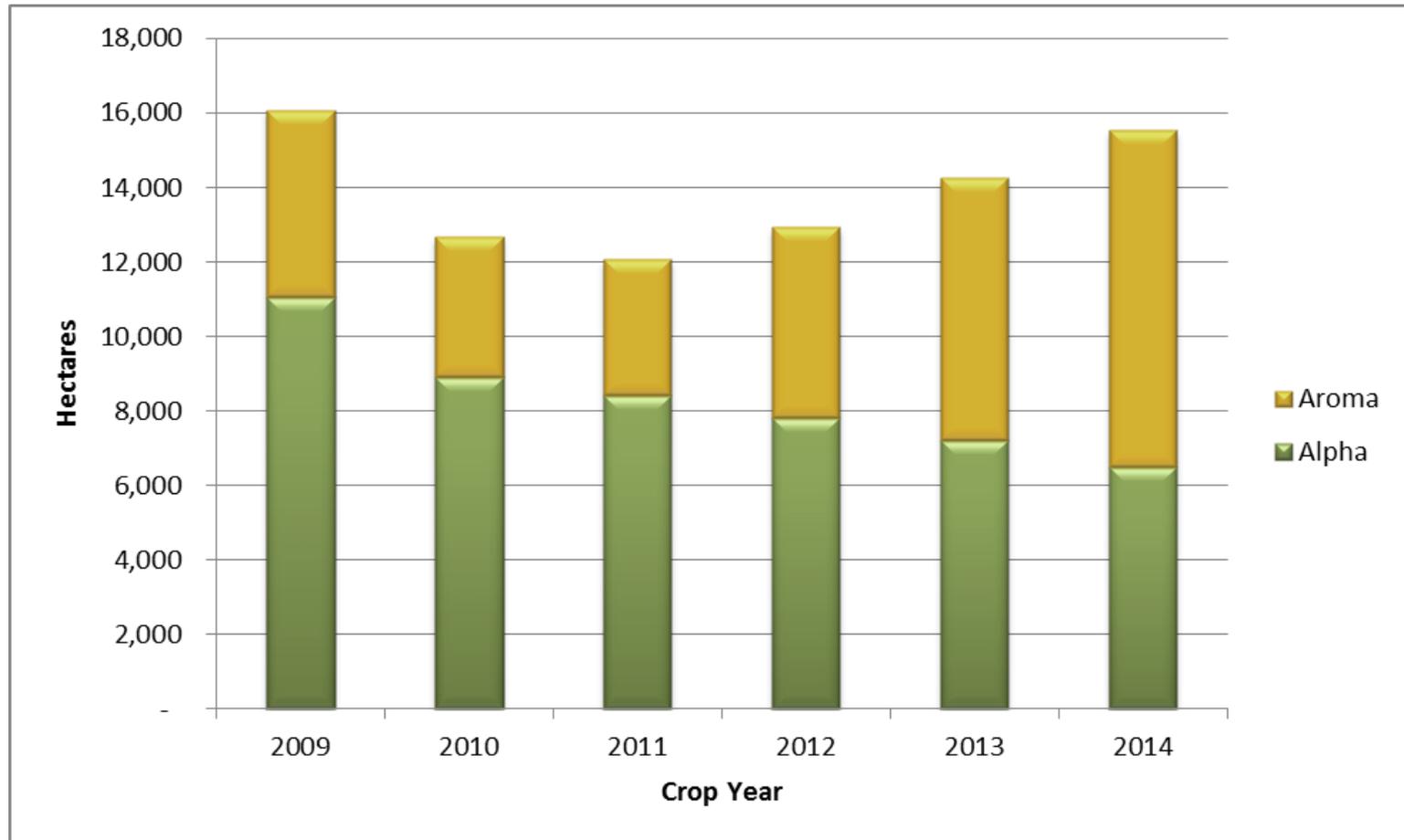
Reaction on Supply Side

US growers are dramatically increasing aroma acreage



- It should be noted that the US-Aroma variety Willamette was reduced by approx. 6,000 acres during that period.

Bitter vs Aroma Hop Acreage USA



Over 65 commercial varieties - Main U.S. variety is Cascade

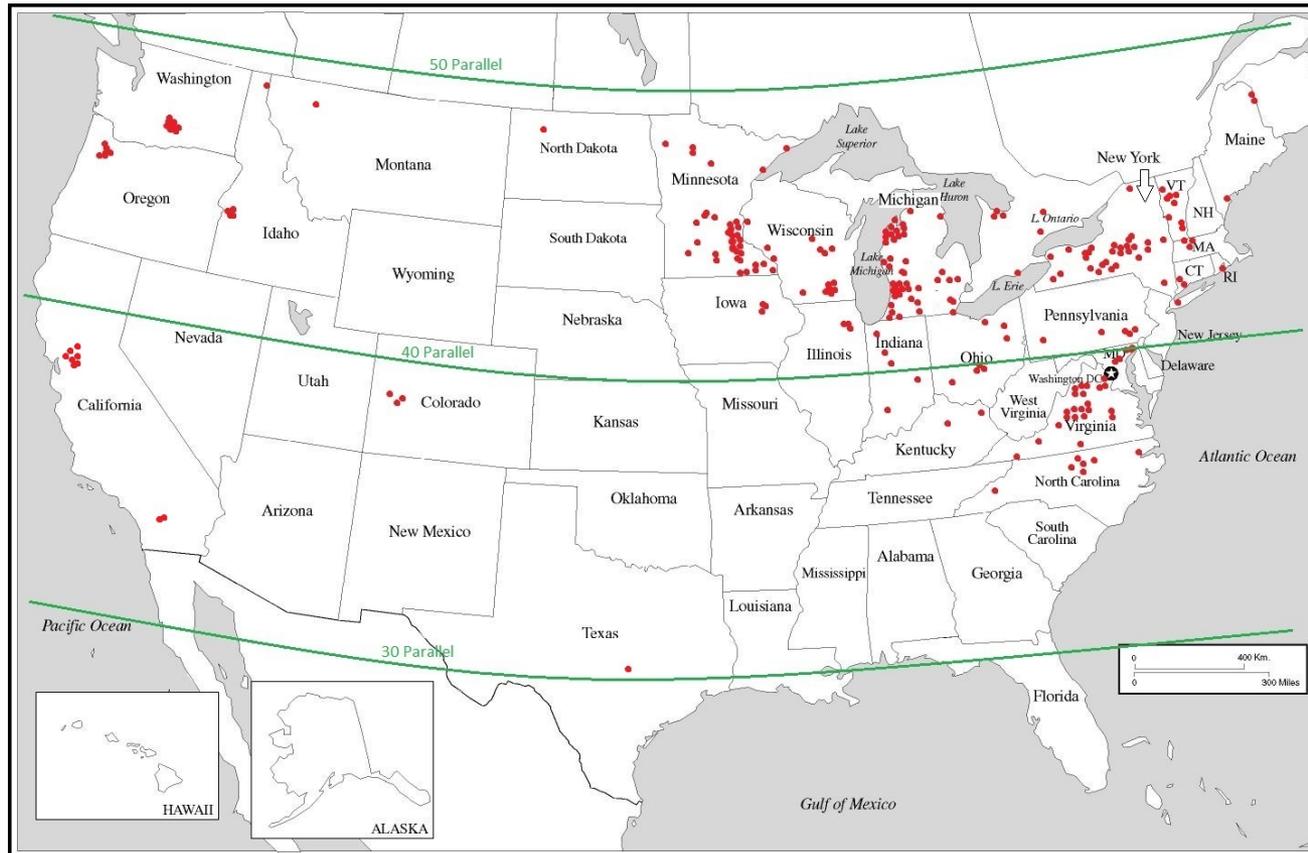
USA Aroma Hop Acreage

Variety	2014 Acres
Cascade	6,619
"Other"	4,243
Centennial	3,353
Simcoe®	1,886
Citra®	1,761
Chinook	1,641
Willamette	1,159
Mosaic™	671
"Experimental"	433
Mt Hood	419
Golding	328
Palisade®	223
Crystal	210
Athanium™	194

Variety	2014 Acres
El Dorado®	145
N. Brewer	131
Sterling	130
Glacier	126
Perle	100
Azacca™	79
Jarrylo™	75
Vanguard	58
Amarillo®	??
Equinox™	??
Lemondrop™	??
Sorachi Ace	??
Cashmere	??
Calypso	??

SOURCE: USDA-NASS and Hop Growers of America.

Expanding Hop Growing Areas in U.S.



Pacific Northwest Hop Acreage > 38,000
Other U.S. ≈ 1,500

Summary US

- Hop Usage up tremendously with the craft market driving much of the innovations in hop dosing, aroma, and new variety development.
- Much greater attention on breeding programs and new varieties. Over 65 commercial varieties now grown in U.S.
- Large number of varieties puts logistical pressure on growers and suppliers, and can complicate availability.
- Commercial hop operations expanding beyond Pacific Northwest, but current acreage very limited and available only to local markets.
- Larger brewers focusing on "crafty" beer styles, but highly hopped beers are difficult for many of their brewing systems.



Final Thoughts

- Flavor varieties in great demand and many newer flavor varieties are in tight supply. Hops are the center of attention!
- More demand for aroma / flavor = tremendous motivation in hop breeding and greater number of varieties.
- Craft beer boom not only in U.S. but now taking place in Europe, Asia, South America, Australia.
- What was considered to be a high hop dosing rate only 5 years ago (1 lb/bbl) is now considered tame in some craft circles. India Pale Ales now the largest craft category.
- Great deal of information about hops on the web, in forums, blogs and other social media, but much is highly dubious.





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Thank You for Your Attention!

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