Craft beer trends and the state of Michigan hops

UVM Hop Conference
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No Red States or Blue States.

ONLY BREW STATES.

CRAFTBEER.COM

CRAFT BREWER DEFINITION

AN AMERICAN CRAFT BREWER IS SMALL, INDEPENDENT, AND TRADITIONAL.

SMALL

Annual production of 6 million barrels of beer or less (approximately 3 percent of U.S. annual sales). Beer production is attributed to the rules of alternating proprietorships.

INDEPENDENT

Less than 25 percent of the craft brewery is owned or controlled (or equivalent economic interest) by a beverage alcohol industry member that is not itself a craft brewer.

TRADITIONAL

A brewer that has a majority of its total beverage alcohol volume in beers whose flavor derives from traditional or innovative brewing ingredients and their fermentation. Flavored malt beverages (FMBs) are not considered beers.

Source: Brewers Association, Boulder, CO

U.S. BEER SALES VOLUME GROWTH 2014

OVERALL BEER
0.5%
197,124,407 bbls

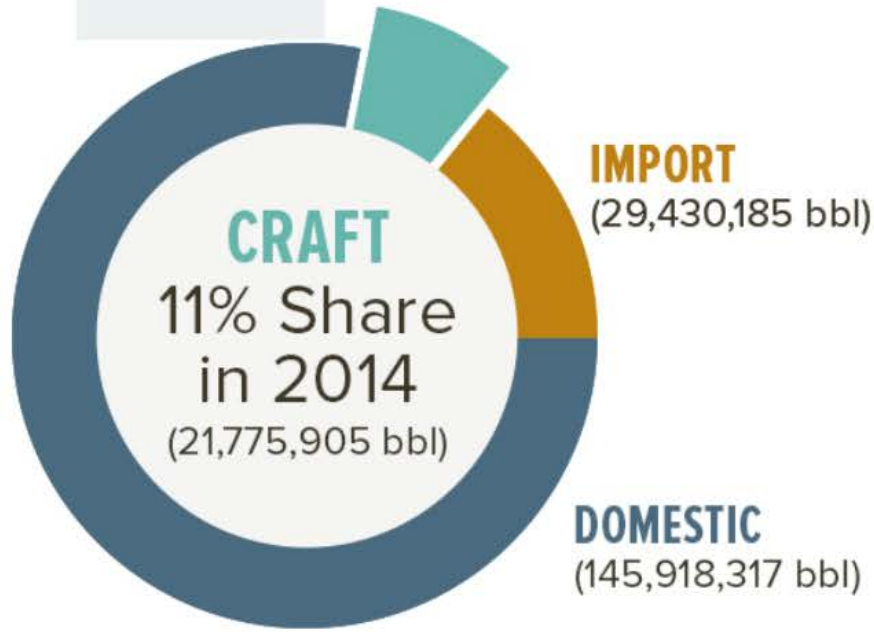
17.6%
CRAFT
21,775,905 bbls

IMPORT BEER
6.9%
29,430,185 bbls

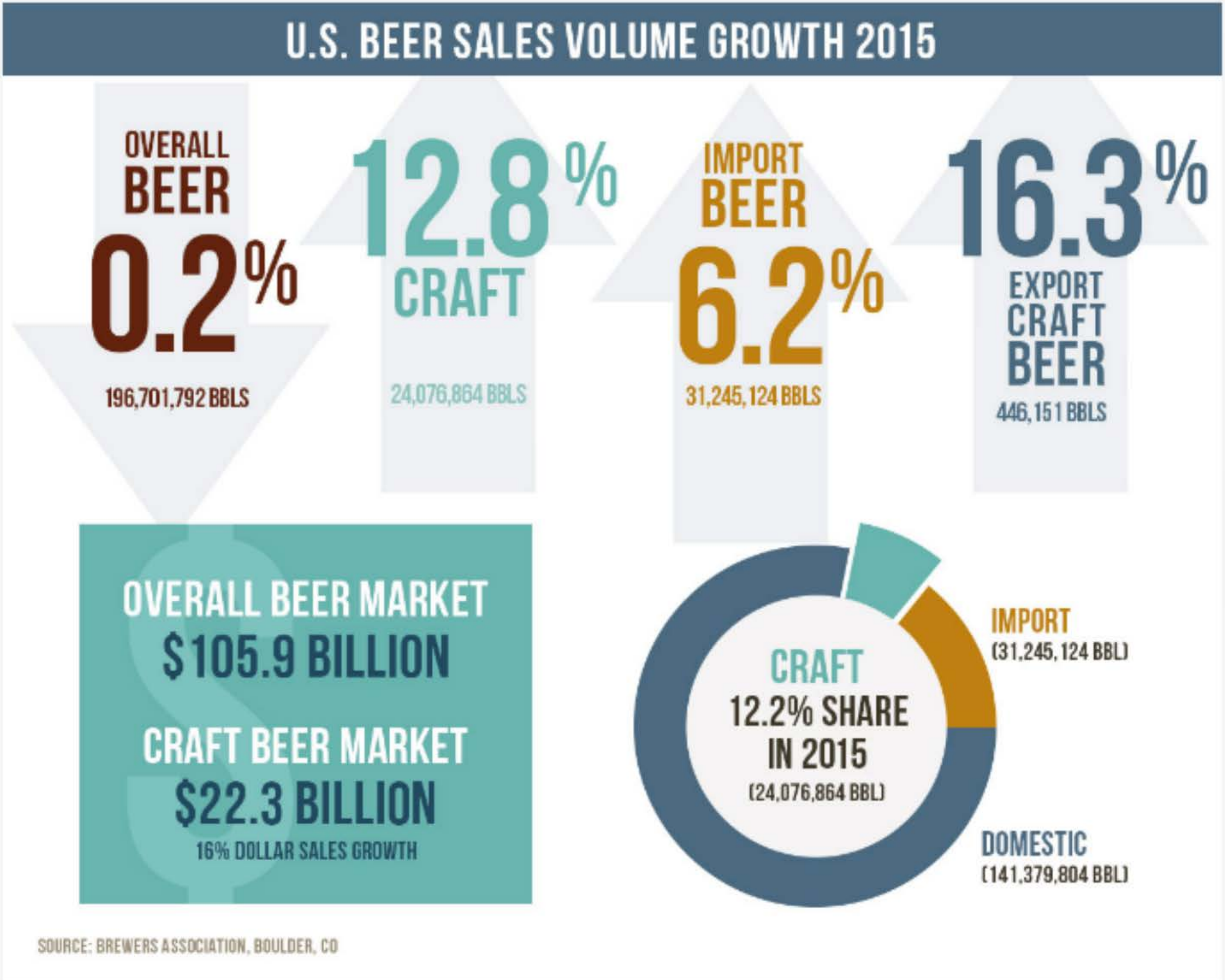
36%
EXPORT CRAFT BEER
383,422 bbls

OVERALL BEER MARKET
$101.5 BILLION

CRAFT BEER MARKET
$19.6 BILLION
22% DOLLAR SALES GROWTH



Source: Brewers Association, Boulder, CO


U.S. BEER SALES VOLUME GROWTH 2015
OVERALL BEER
0.2%
196,701,792 BBLS
12.8%
CRAFT
24,076,864 BBLS
IMPORT BEER
6.2%
31,245,124 BBLS
16.3%
EXPORT CRAFT BEER
446,151 BBLS
OVERALL BEER MARKET
$105.9 BILLION
CRAFT BEER MARKET
$22.3 BILLION
16% DOLLAR SALES GROWTH
CRAFT
12.2% SHARE IN 2015
(24,076,864 BBL)
IMPORT
(31,245,124 BBL)
DOMESTIC
(141,379,804 BBL)
SOURCE: BREWERS ASSOCIATION, BOULDER, CO

U.S. BEER SALES VOLUME GROWTH 2016

OVERALL BEER
0.0%
196,749,624 BBLS

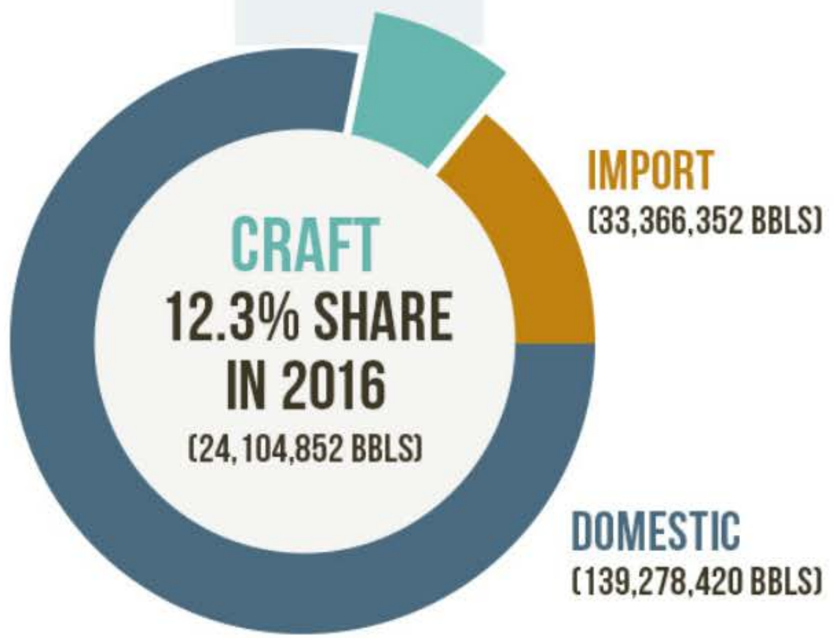
6.2%
CRAFT
24,104,852 BBLS

IMPORT BEER
6.8%
33,366,352 BBLS

4.4%
EXPORT CRAFT BEER
465,617 BBLS

OVERALL BEER MARKET
$107.6 BILLION

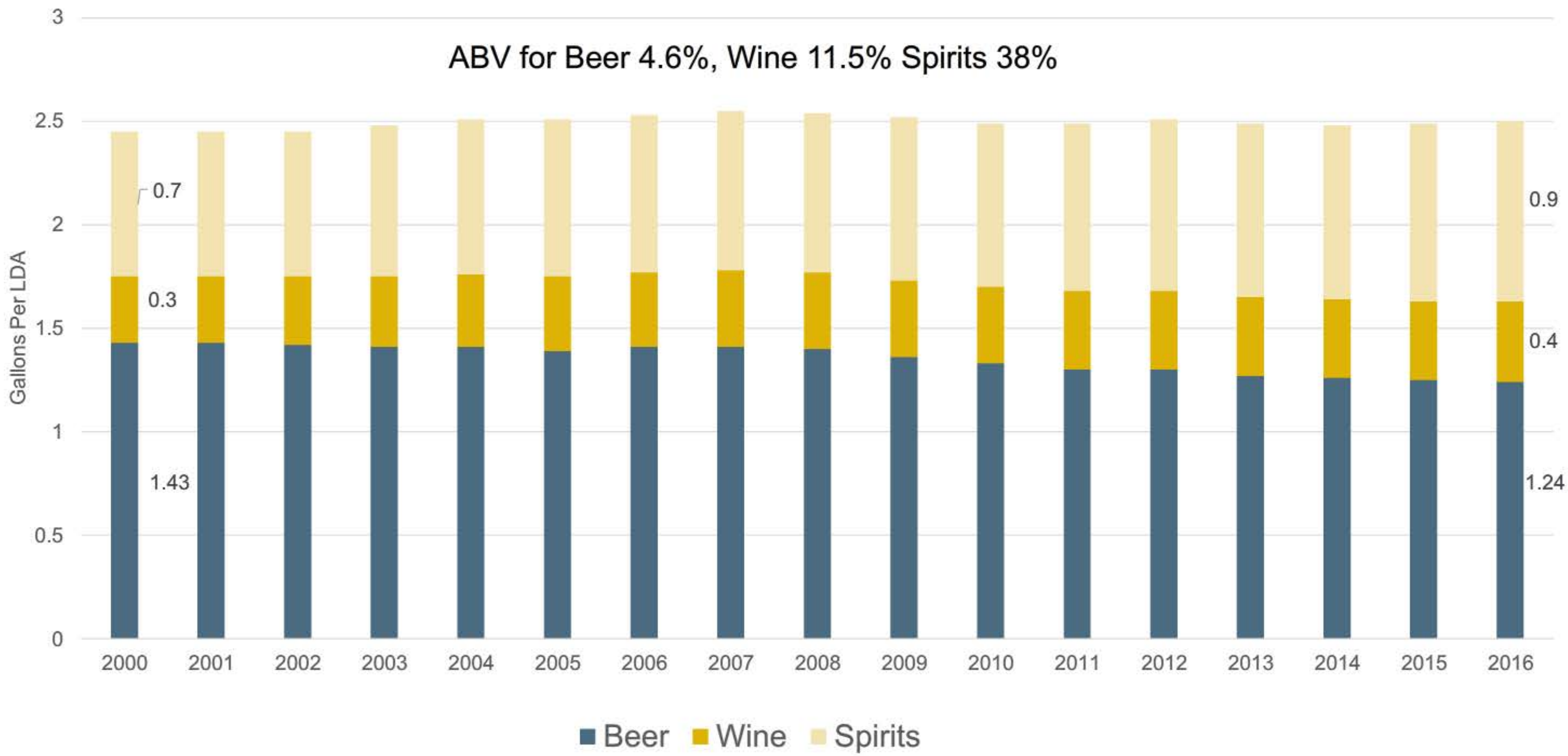
CRAFT BEER MARKET
$23.5 BILLION
10% DOLLAR SALES GROWTH



BREWERS ASSOCIATION

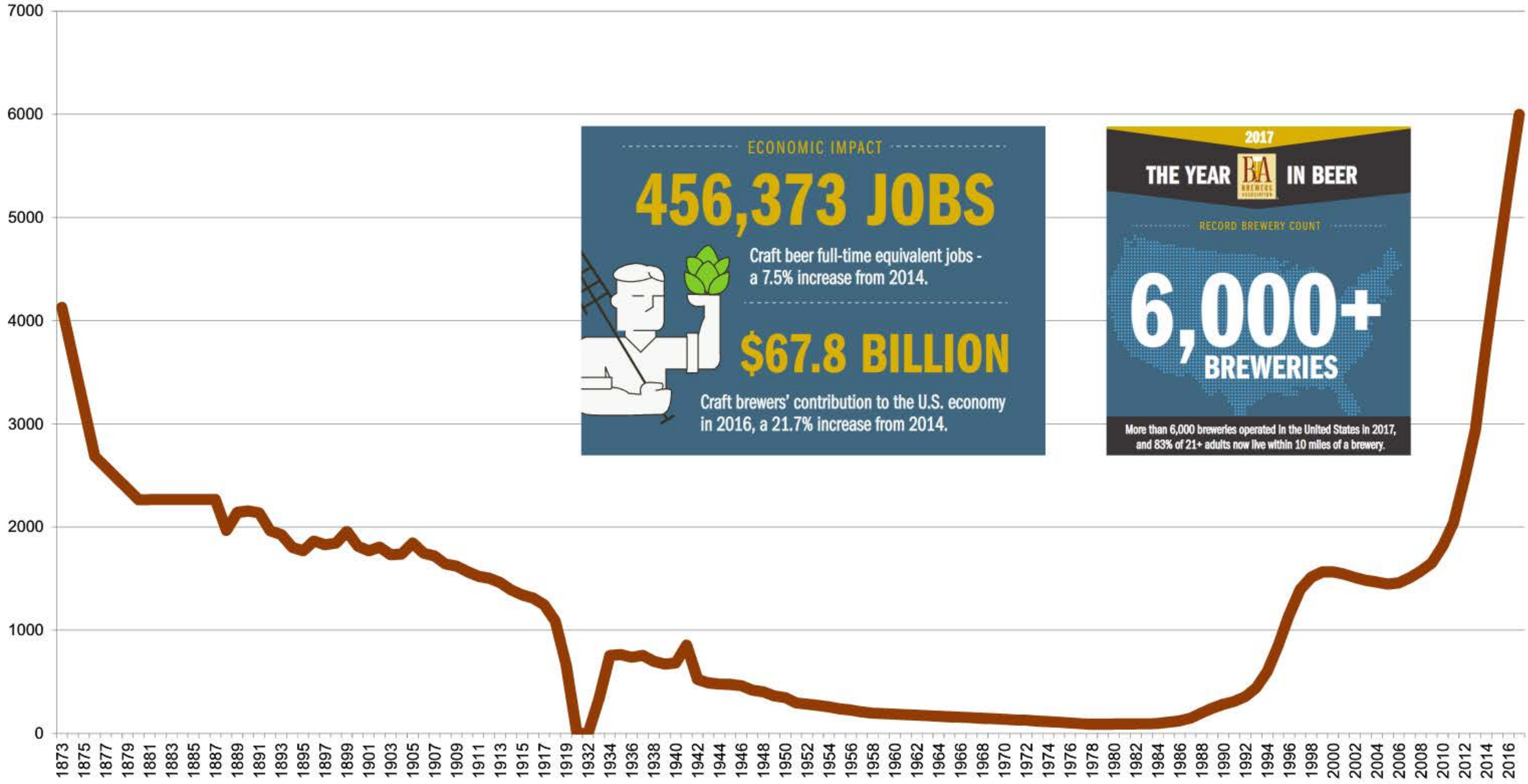
SOURCE: BREWERS ASSOCIATION, BOULDER, CO

Per Capita Consumption of Ethanol U.S. from 2000 to 2016



Number of Breweries, 1873 - 2017

Sources:
Brewers Association
and Beer Institute



CERTIFIED INDEPENDENT

2,700+ SEAL ADOPTERS!

Representing over 75% of domestic, independent craft beer production.

BEER IS BIPARTISAN

The Craft Beverage Modernization and Tax Reform Act (CBMTRA) was reintroduced in the 115th Congress and has reached a majority of support in both houses.

TAKE A BEERCATION

Beer tourism is growing, with the average craft drinker visiting 3.5 breweries near their homes and 2.5 breweries within two hours' driving distance.

CRAFT BREWERS HAVE A VOICE

TAKE CRAFT BACK

A tongue-in-cheek consumer awareness campaign garnered over $3.7 million in mock pledges from nearly 12,000 beer lovers in an attempt to raise $213 billion to purchase Anheuser-Busch InBev.

$73.4 MILLION

Donations from craft brewers to charitable causes in 2016, up from $71 million in 2014.

1.1 MILLION HOMEBREWERS

Over 1 million homebrewers produced more than 1.4 million barrels of beer – equaling 1% of total U.S. beer production.

Want more statistics on the U.S. beer scene?

Visit BrewersAssociation.org

Craft Answers Consumer Demand for Extreme Flavor & High-Alcohol Content

"Originals"

- Traditional mild pale / American lagers at Premium - Sub Premium price points
- Marquee beer giants' legacy brands and traditional sub-brands (Bud Light, Miller Light, Coors Light)

"Exaggerated"

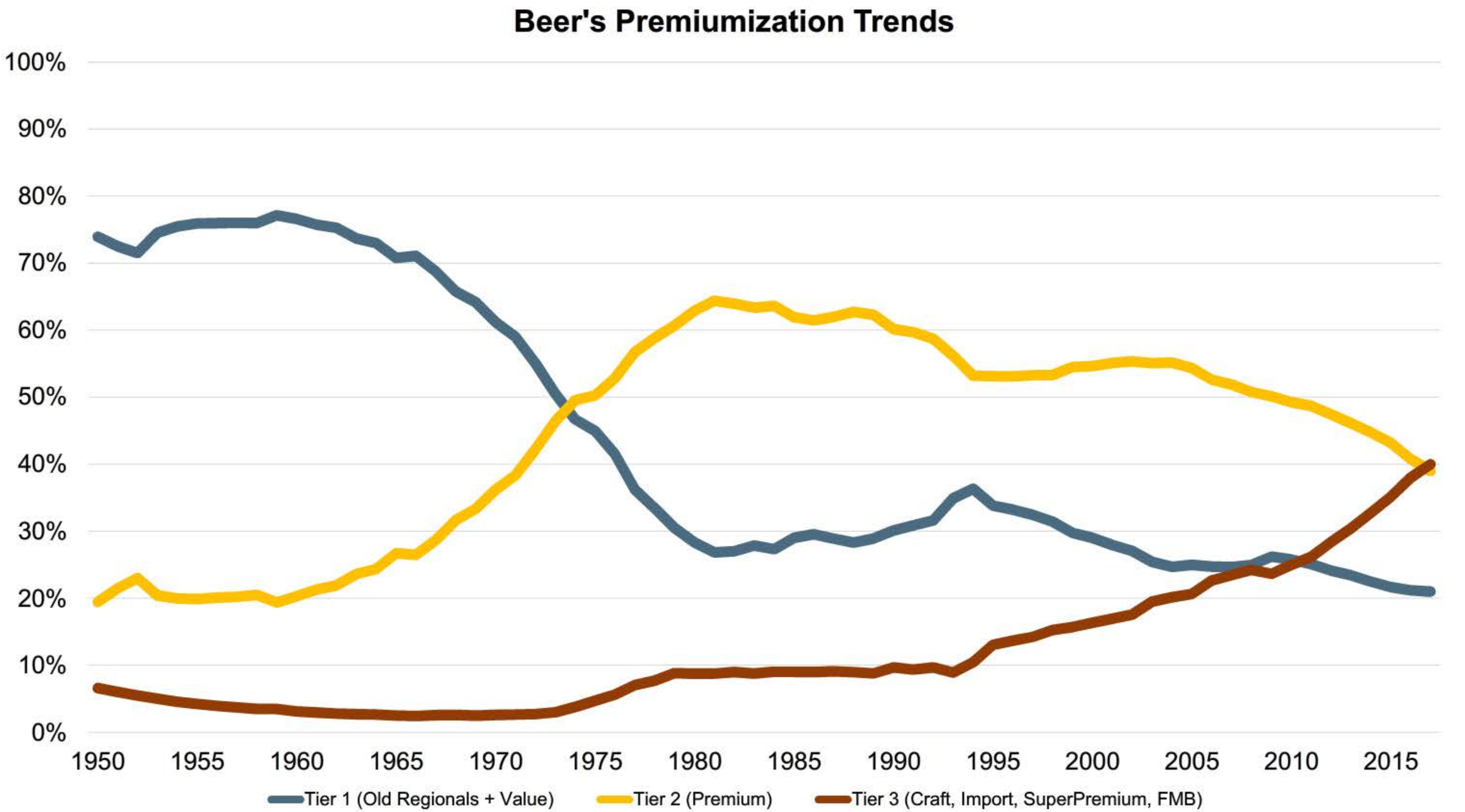
- Premium - Super Premium line extensions leveraging legacy brand name while varying type, flavoring, and calorie count

"Revisionists"

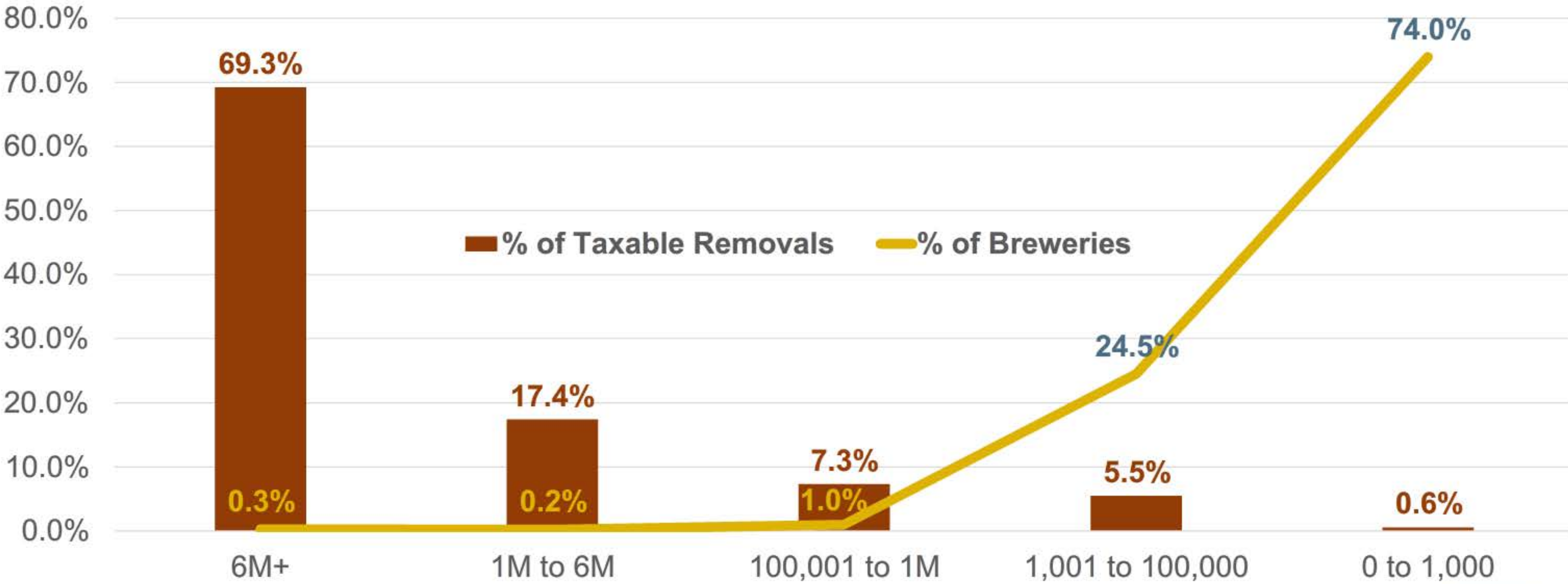
- Super Premium independent Craft brands / incognito Craft brands (Blue Moon, Shock Top, Leinenkugel) identifying strongly with a sense of place, personality, or specific product
- Unique, hoppy, seasonal, flavored
- IPAs, porter, stout, pilsner, black & tan, rye, wheat beer, etc.

"Extremists"

- Super Premium independent Craft brands producing extreme / adventurous / intense Craft Beer
- Innovative brewing, double portions of hops, barrel fermenting / aging, bottle fermenting, fruit infusing, large format bottles
- Additional Beer types: imperial stout, double IPA, sour ale, smoked porter etc.
- Experimentation with Beer-Wine hybrids


Beer's Premiumization Trends
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Tier 1 (Old Regionals + Value)
Tier 2 (Premium)
Tier 3 (Craft, Import, SuperPremium, FMB)

2016 US Breweries by Size



Source: IRI MULO+C, Total US, YTD thru 12/24/17	**Total US for Small Brewers**	
Brewer Size (CEs)	Growth % YTD	% Volume
1,000,000+	-1.7%	61.2%
100k to 1M	6.0%	24.5%
10K to 100K	17.1%	12.1%
Less than 10K + New	58.5%	2.2%

GOLD MEDAL WINNER

GREAT AMERICAN BEER FESTIVAL, 2011

Who would of thought that what started as an inside joke amongst the Right Brain brew team would evolve into our most acclaimed beer ever?

Brewed with **REAL** Mangalitsa pig heads and bones, this rich and chocolaty porter is infused with a symphony of salty, smoky, and savory flavors.

Some have hailed it as the 'quintessential bacon beer' while others call it a true breakfast brew. Regardless of what you call it this imaginative and complex beer simply has to be tried to be understood.

RIGHT BRAIN®
BREWERY

EXTRACTS ARE FOR SISSIES

MANGALITSA PIG PORTER

PORTER BREWED WITH REAL PIG PARTS

RIGHT BRAIN BREWERY
225 E. 16th Street
Traverse City, MI 49684
www.rightbrainbrewery.com

Alc. 6.4% by Vol

CONTENTS
1 PINT & 6 FL. OZ.

REMEMBER: BEER NO EVIL®

GOVERNMENT WARNING: (1) ACCORDING TO THE SURGEON GENERAL, WOMEN SHOULD NOT DRINK ALCOHOLIC BEVERAGES DURING PREGNANCY BECAUSE OF THE RISK OF BIRTH DEFECTS. (2) CONSUMPTION OF ALCOHOLIC BEVERAGES IMPAIRS YOUR ABILITY TO DRIVE A CAR OR OPERATE MACHINERY, AND MAY CAUSE HEALTH PROBLEMS.

MI 10¢ DEPOSIT

7 00175 34250 8

Craft is Reshaping the Way Beer is Marketed from "Brand" to "Style" like Wine

Commentary

- Style (instead of brand) is becoming the more important aspect of consumer choice, especially among Millennials
  - The consumer chooses style first (Pale, Ale, IPA, Wheat, etc.) and then chooses brand within style (Sierra Nevada, Lagunitas, Blue Moon, etc.)
- Craft is enabling producers to dialogue with retailers about maintaining and expanding shelf space to prevent further erosion from Wine and Spirits
- Retailers are beginning to merchandise beer by style, just as they merchandise wine by varietal
- Cider and Flavored Malt Beverages (FMBs) are further expanding Beer's retailer shelf space

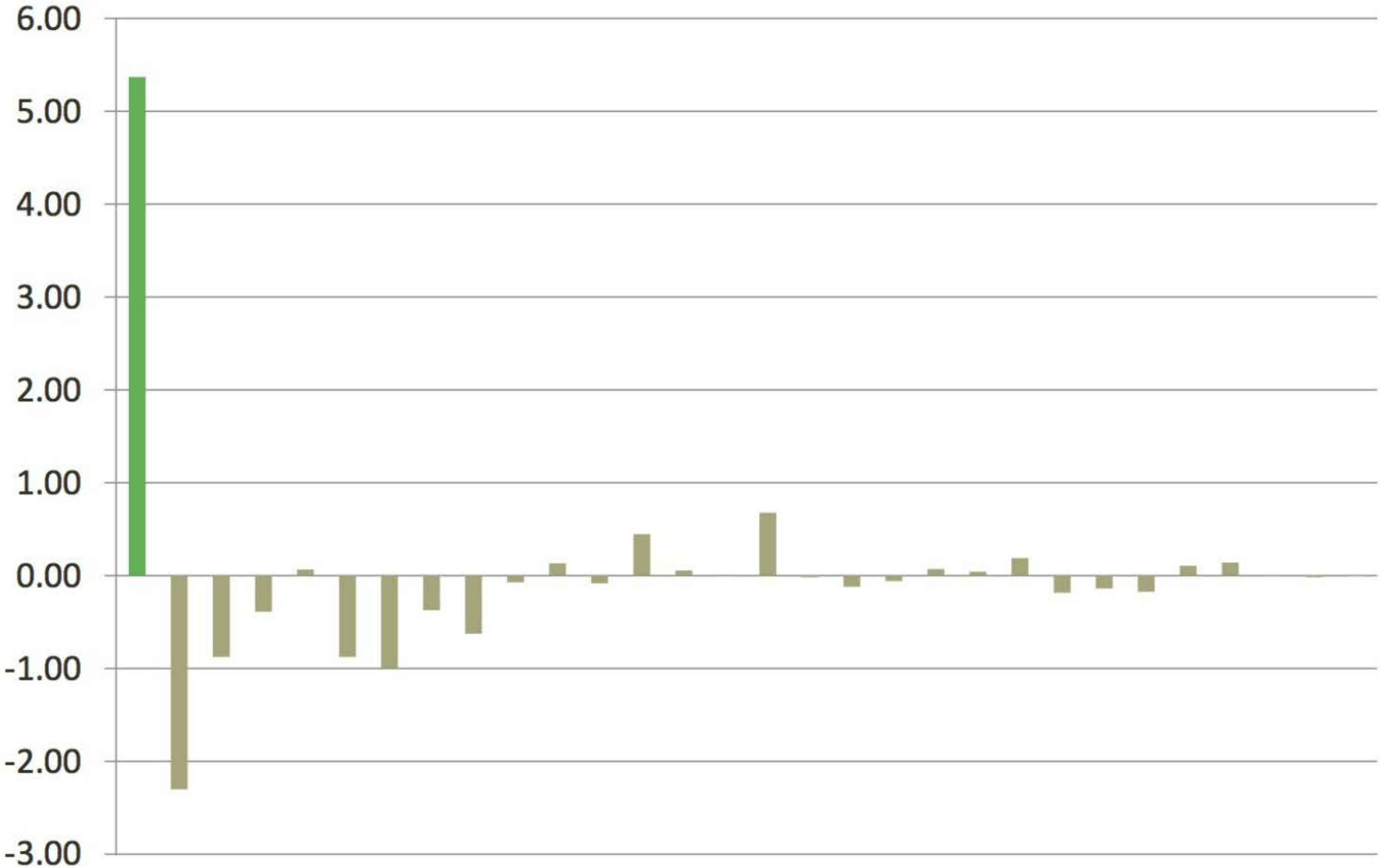
New Merchandising of Beer by Style

Pale Ale

IPA

Wheat Beer

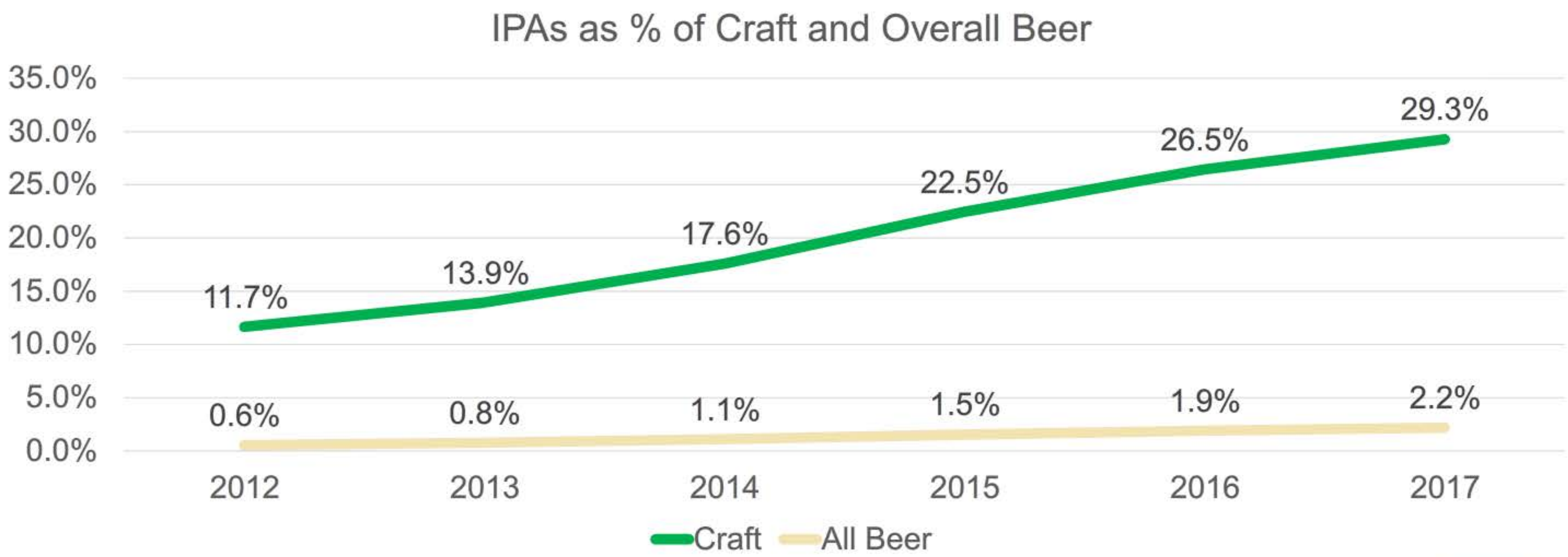
Craft – Volume Share Change by Style, 2015



Source: IRI (2016)

Dr. Bart Watson, B.A. 2016 American Hop Convention

IPA's Rise



IPAs as % of Craft and Overall Beer
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
11.7%
13.9%
17.6%
22.5%
26.5%
29.3%
0.6%
0.8%
1.1%
1.5%
1.9%
2.2%
2012
2013
2014
2015
2016
2017
Craft
All Beer

BEER STYLES

2016 Dollar Share & Growth

	$ Sales Share	Growth Rate
IPA	25.4%	22.6%
SEASONAL	13.3%	-2.3%
OTHER PALE LAGERS	11.2%	9.2%
PALE ALE	8.8%	4.4%
VARIETY	7.6%	5.2%
AMBER ALE	4.3%	1.2%
AMBER LAGER	4.1%	-6.3%

Source: IRI Group

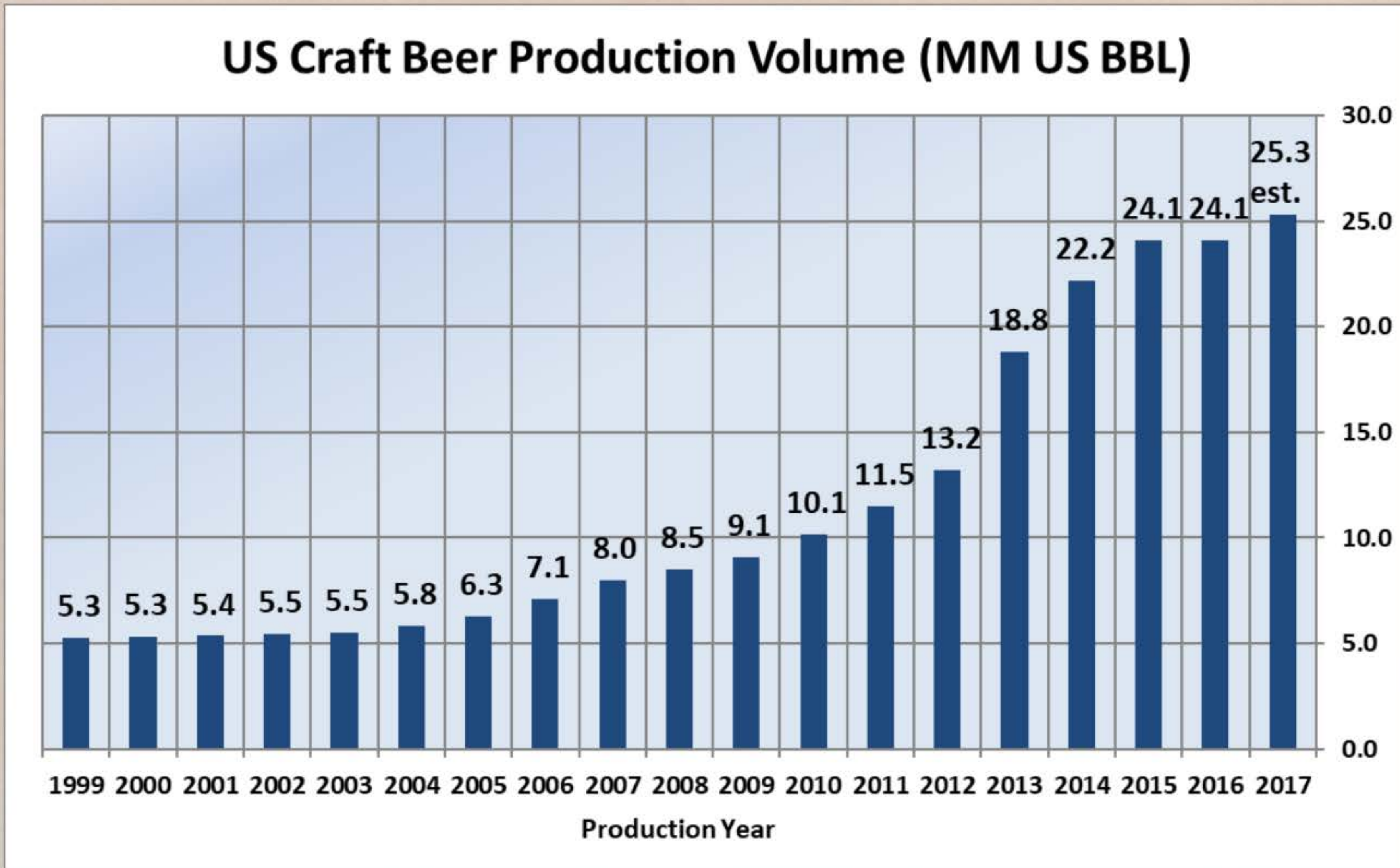
BREWERS
ASSOCIATION

www.brewersassociation.org

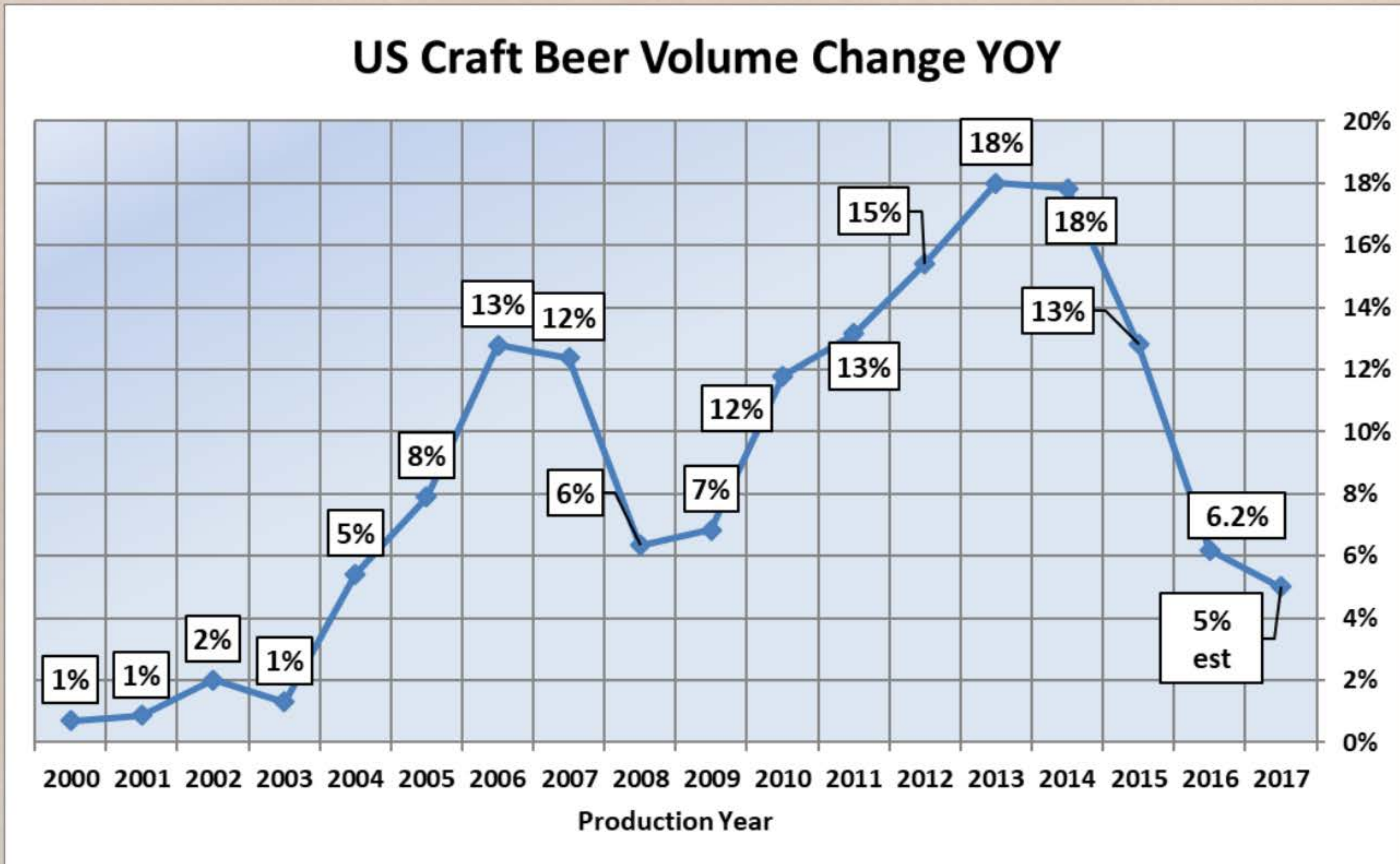
2017 U.S. Brewing Industry Update

- Total U.S. beer sales down ~0.5-1.0%
- Imports grew, but U.S. domestic volume was off ~1.5-2%
- Total number of U.S. breweries tops 6,000 for first time ever
- Craft volume growth rate likely decreased from 6.2% to ~5%, to ~25.3 MM barrels ttl volume

Craft Beer Production 1999 – 2017



Craft Beer Production % Growth 2000 – 2017



2017 U.S. Hop Industry Update

- Ttl U.S. acres increased from 52,963 to 55,786 (+5.3%), an all-time high. Non-PACNW acres grew 19% to 2,500
- Ttl U.S. production increased from 88.6 MM to 106.2 MM pounds (19.8% vs CY2016: +10.7%). Non-PACNW production grew 25%.
- Total U.S. yield increased from 1713 to 1959 pounds per acre (14.4%)
- Idaho: ID production surpassed OR as the number 2 U.S. producing state; Mill 95 opened, the first processor and dealer in Idaho

BA Member Hop Usage Survey

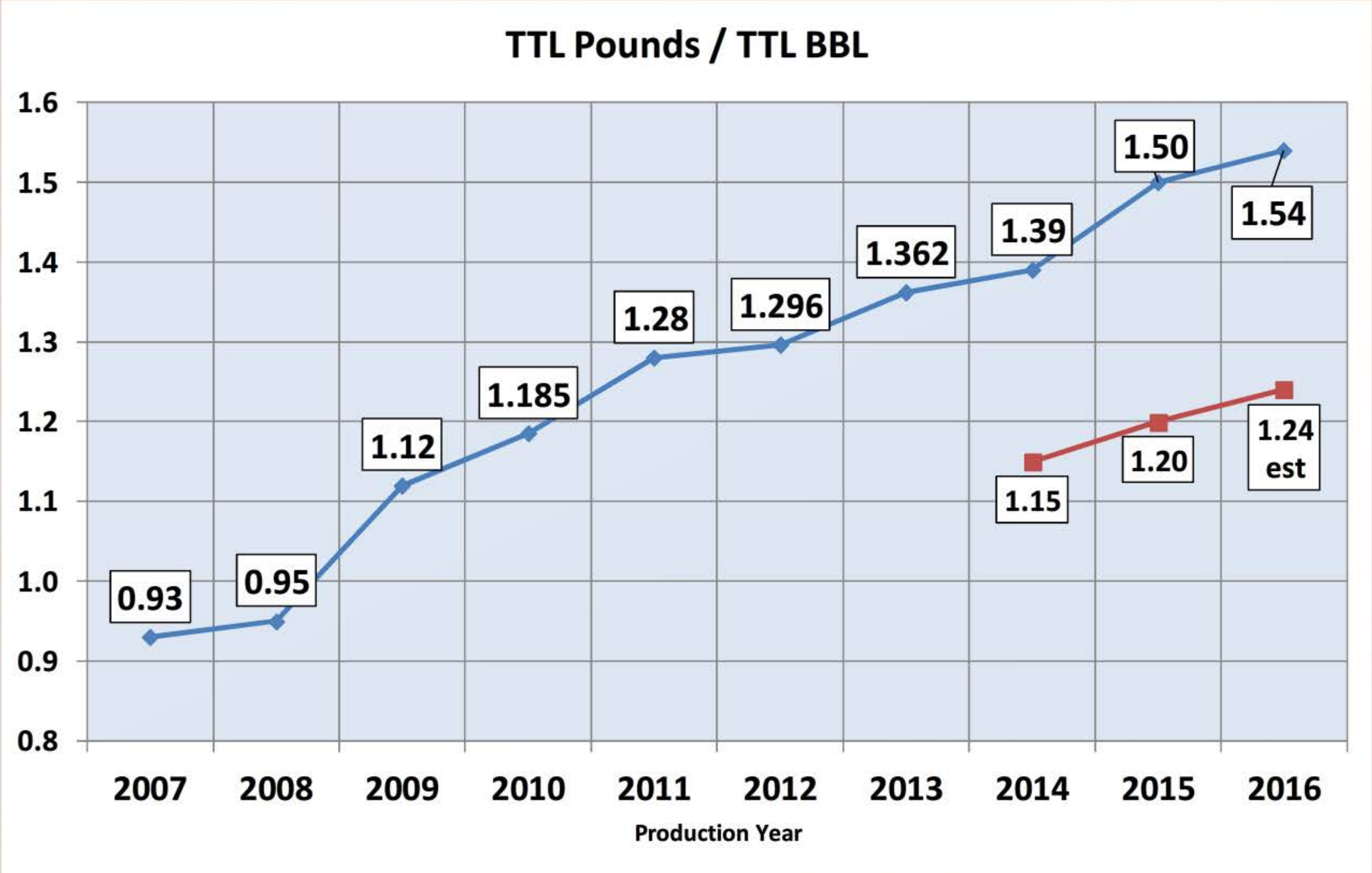
- **Annual Survey in July & August**
- **Ten Years of Data collected 2008 - 2017**
- **Look back to production years 2007 – 2016**
- **Only includes craft volume as defined**
- **A SURVEY, so the results shown are NOT totals: "Actual Mileage May Vary"**

BA Annual Hop Survey + USDA National Hop Reports + BA BIPS Survey + USDA NASS Hop Stocks Reports => This presentation

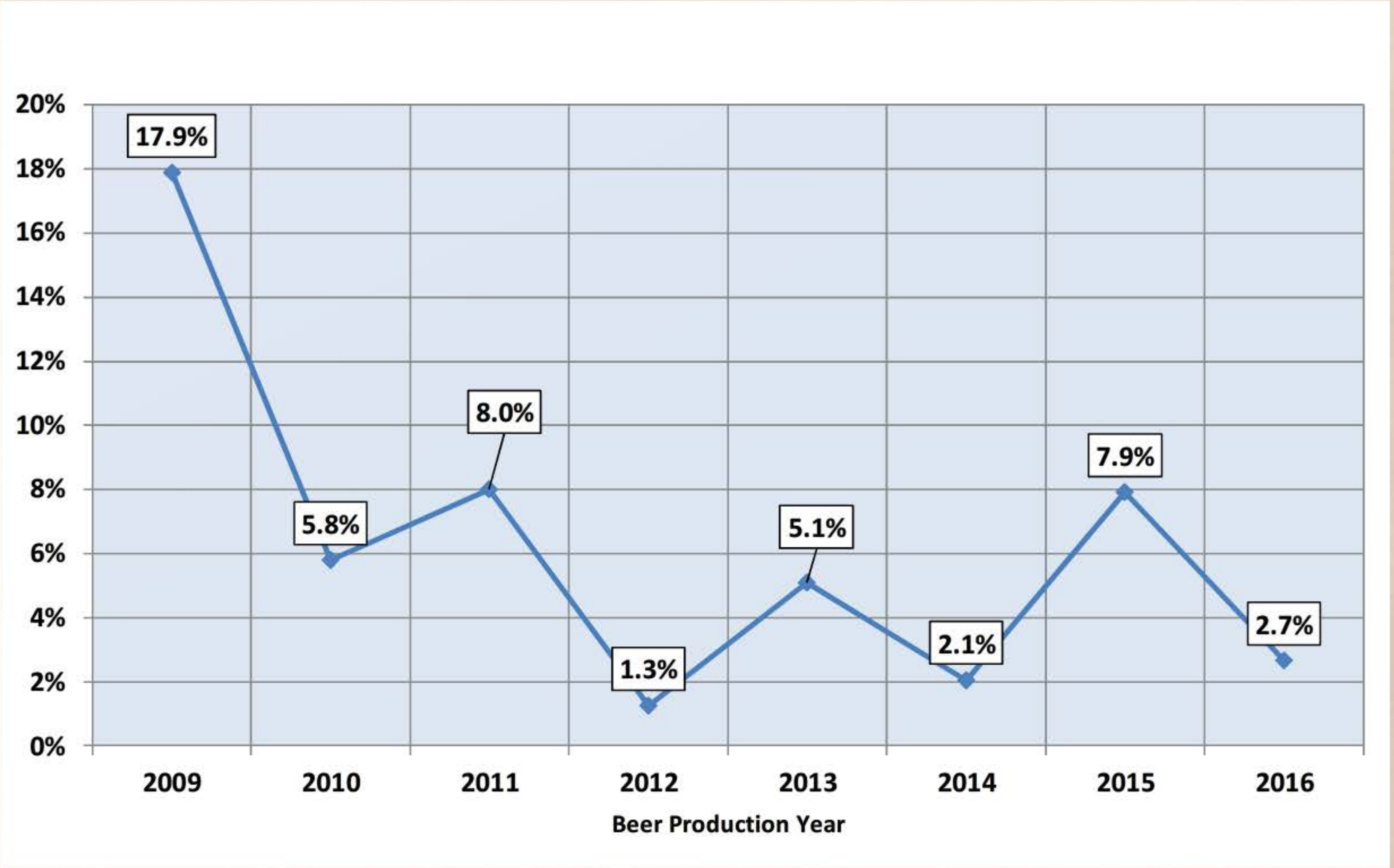
US Brewing & Hop Usage Summary

- Hop usage rates measured in '17 survey increased +2.7% over '16 surveyed rates from 1.50 to 1.54 PPB (2016 beer production year)
- Contracting rates remain high, although they decreased from 96% to 89% overall, and from 89% to 71% among brewers under 2,500 bbls
- Shifts in top ten varieties and ttl varieties
- Shortfalls measured In 2017 in different varieties from 2016
- Measured variety "Impact" for the first time

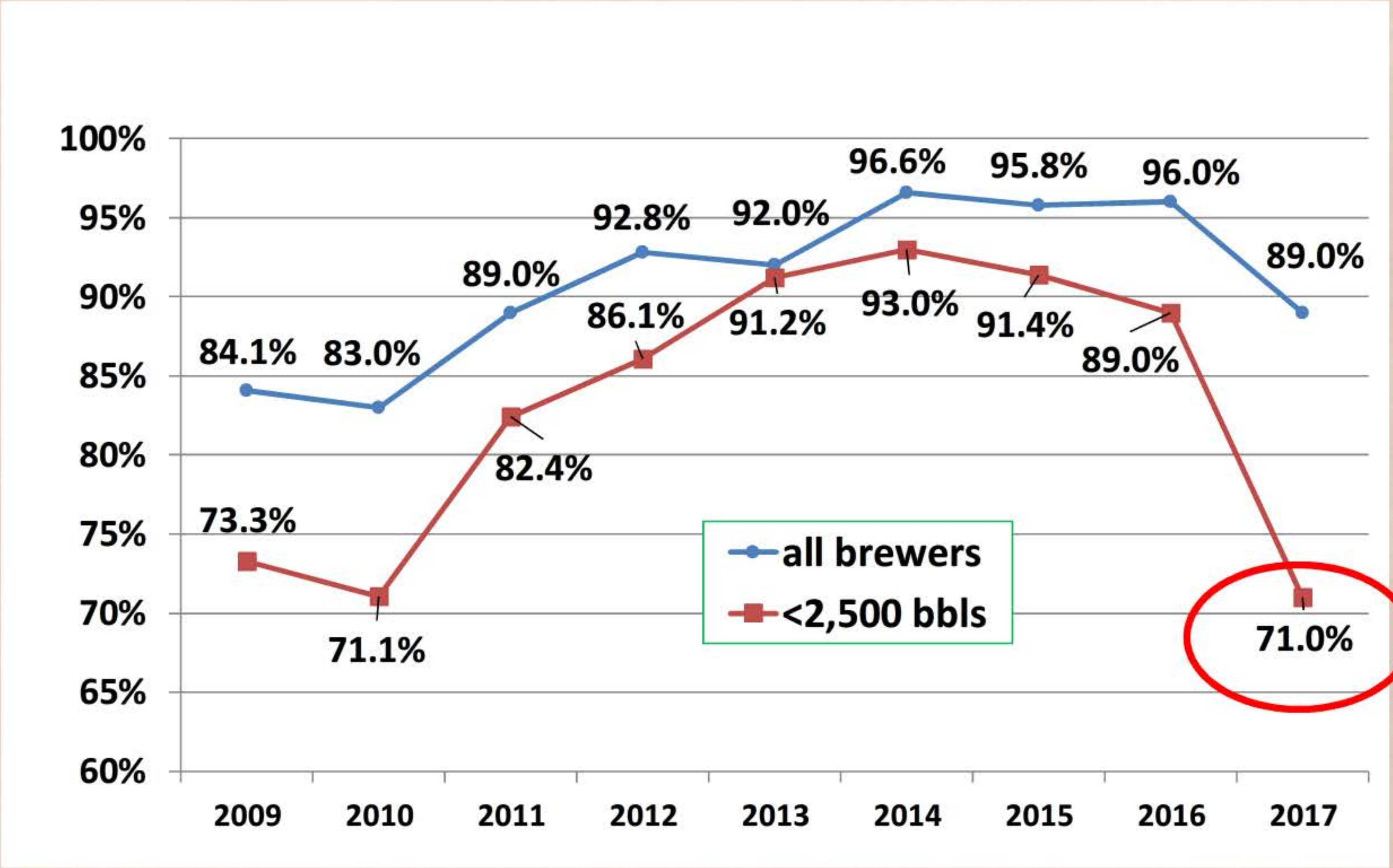
U.S. Craft Beer Hopping Rates



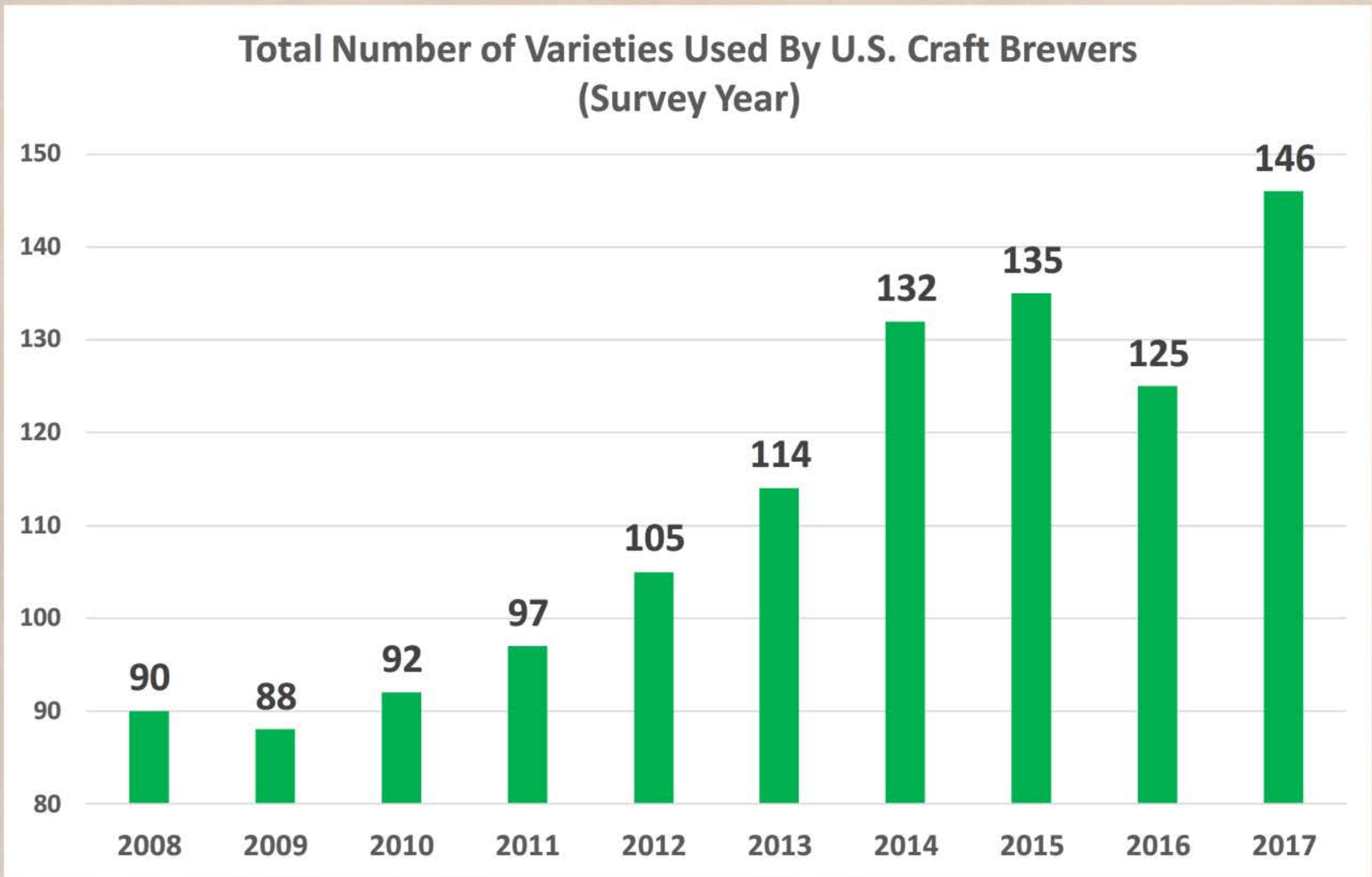
YOY Change in Hop Usage Rates (pounds per bbl)



Contracting Rates By Brewer Volume



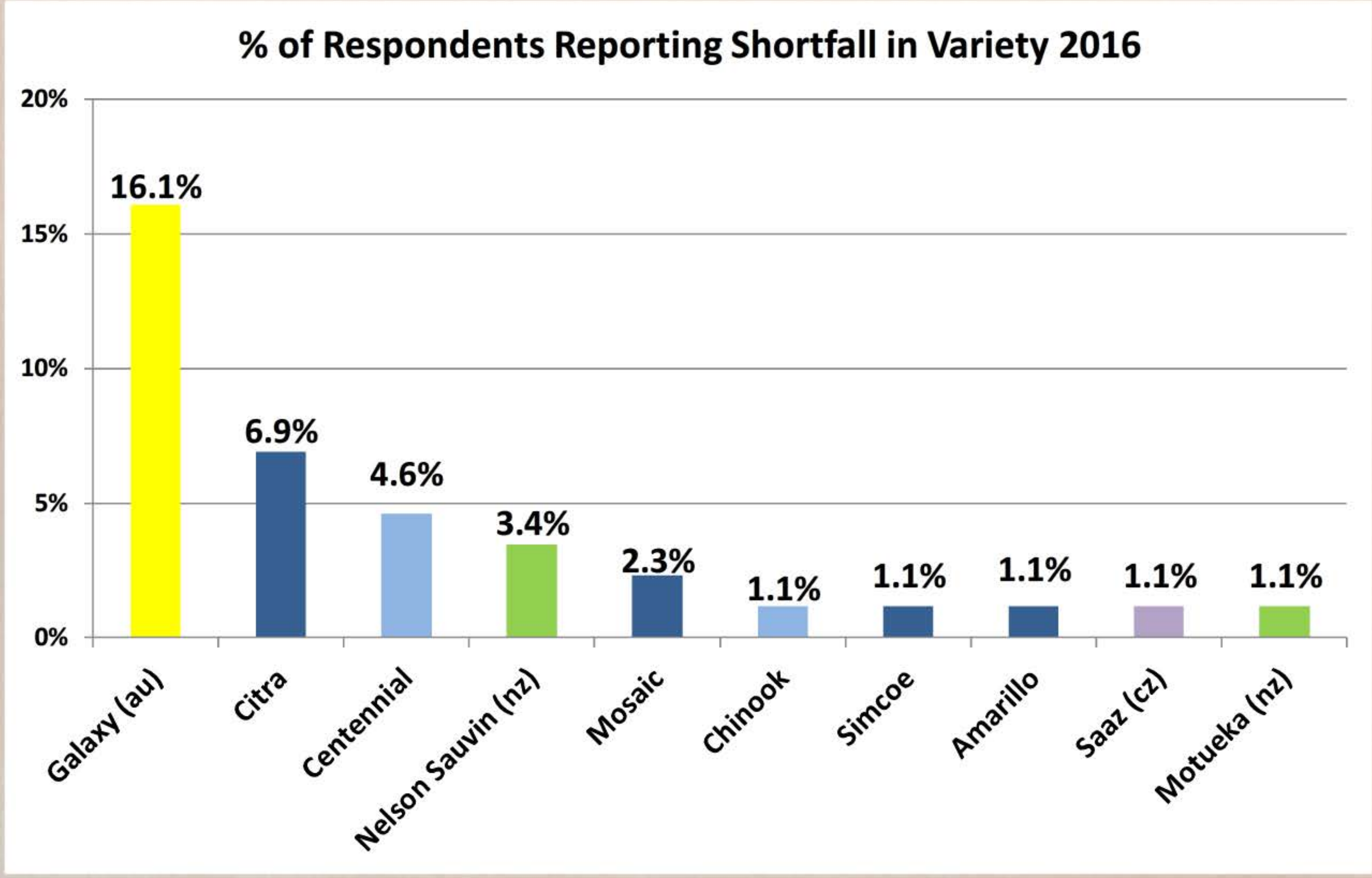
Varieties Drive Volume Growth



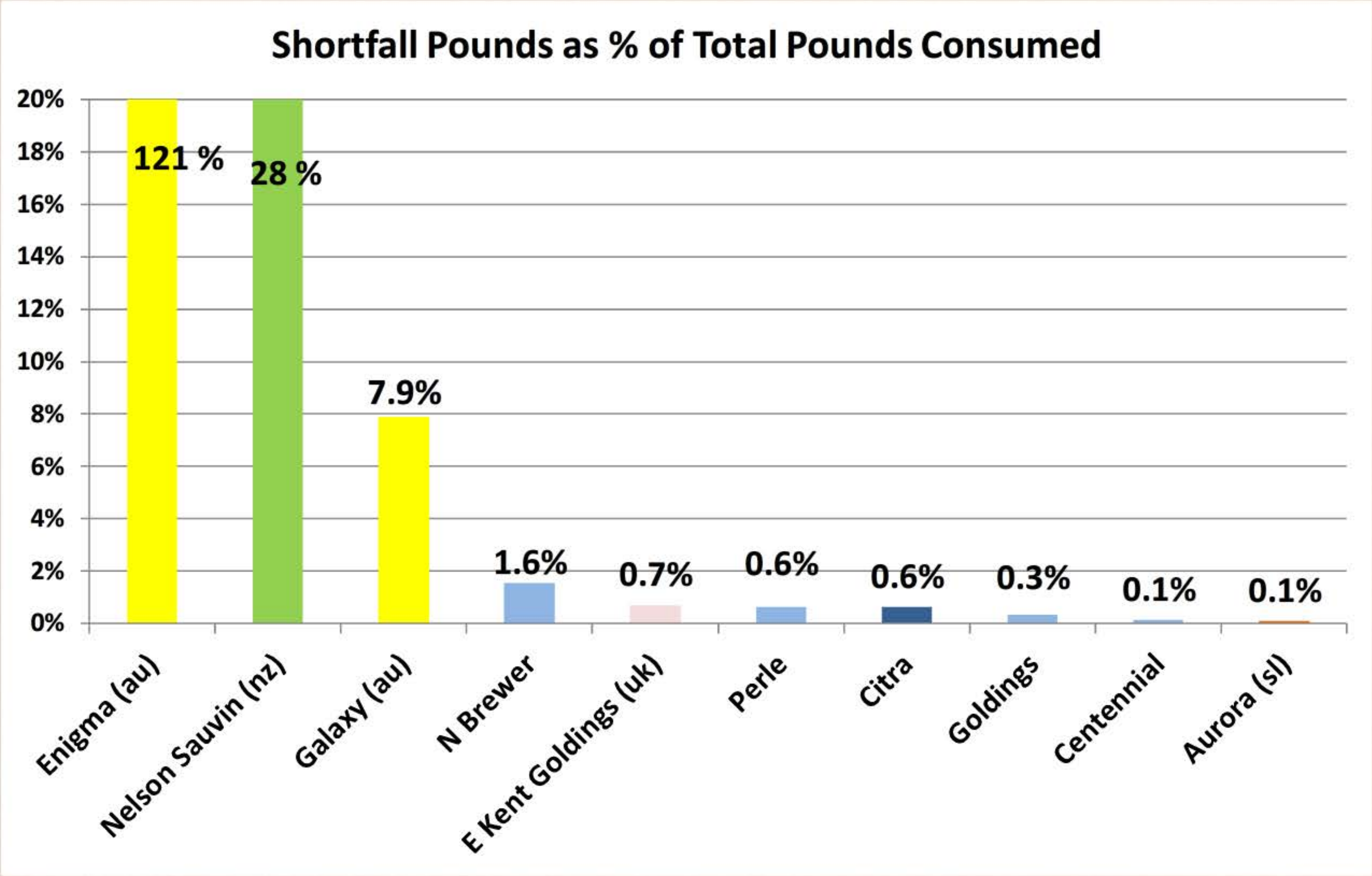
Craft Brewer Hop Usage
Top Ten Varieties

2011 2012	2012 2013	2013 2014	2014 2015	2015 2016	2016 2017
Cascade	Cascade	Cascade	Cascade	Cascade	Cascade
Centennial	Centennial	Centennial	Centennial	Centennial	Centennial
Chinook	Chinook	Simcoe	Chinook	Chinook	Chinook
Willamette	CTZ	Chinook	Simcoe	Simcoe	Simcoe
Simcoe	Simcoe	CTZ	Citra	Citra	Crystal
CTZ	Amarillo	Amarillo	Hall Mitt (Ger)	Amarillo	Citra
US Golding	Crystal	Crystal	Amarillo	Mosaic	Nugget
Crystal	Willamette	Willamette	Crystal	Crystal	Amarillo
Amarillo	Saaz (CZ)	Citra	Magnum (Ger)	Hall Mitt (Ger)	Mosaic
Ahtanum	US Golding	Saaz (CZ)	CTZ	CTZ	Magnum (Ger)

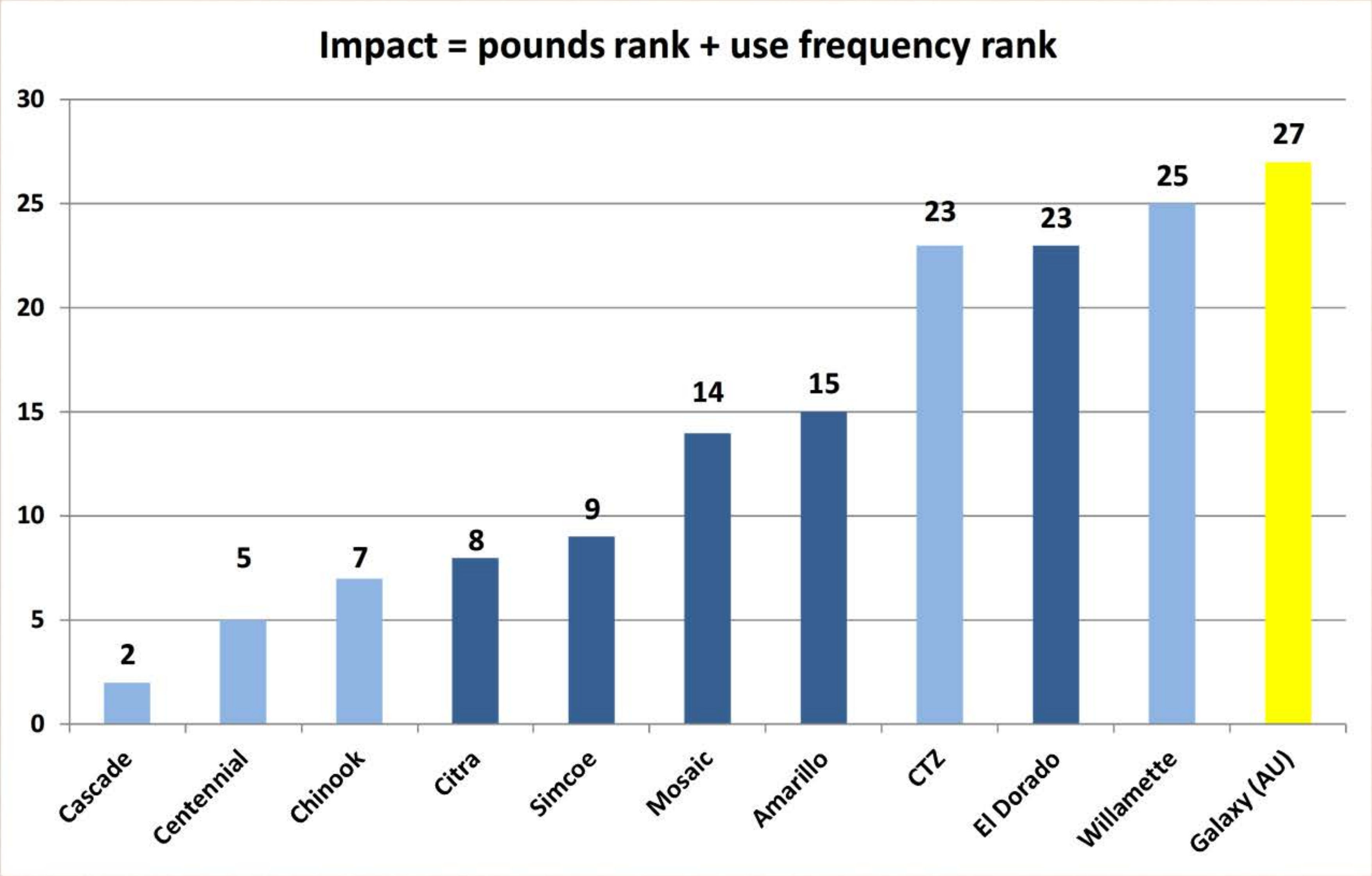
Shortfall By Brewers 2016 Beer Production Year



Shortfall By Gap Size
2016 Beer Production Year



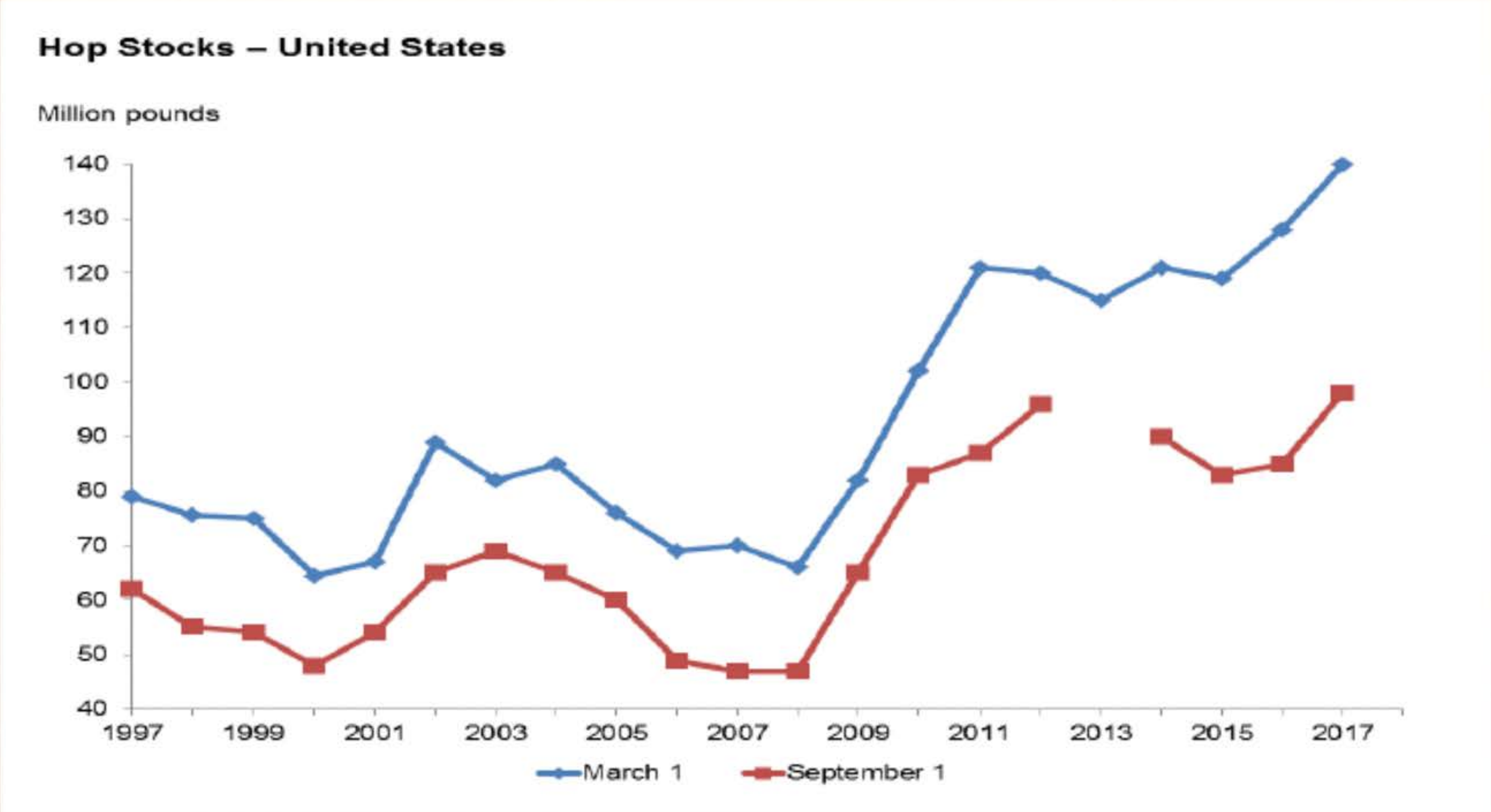
Impact By Variety
2016 Beer Production Year



Definitions and Assumptions

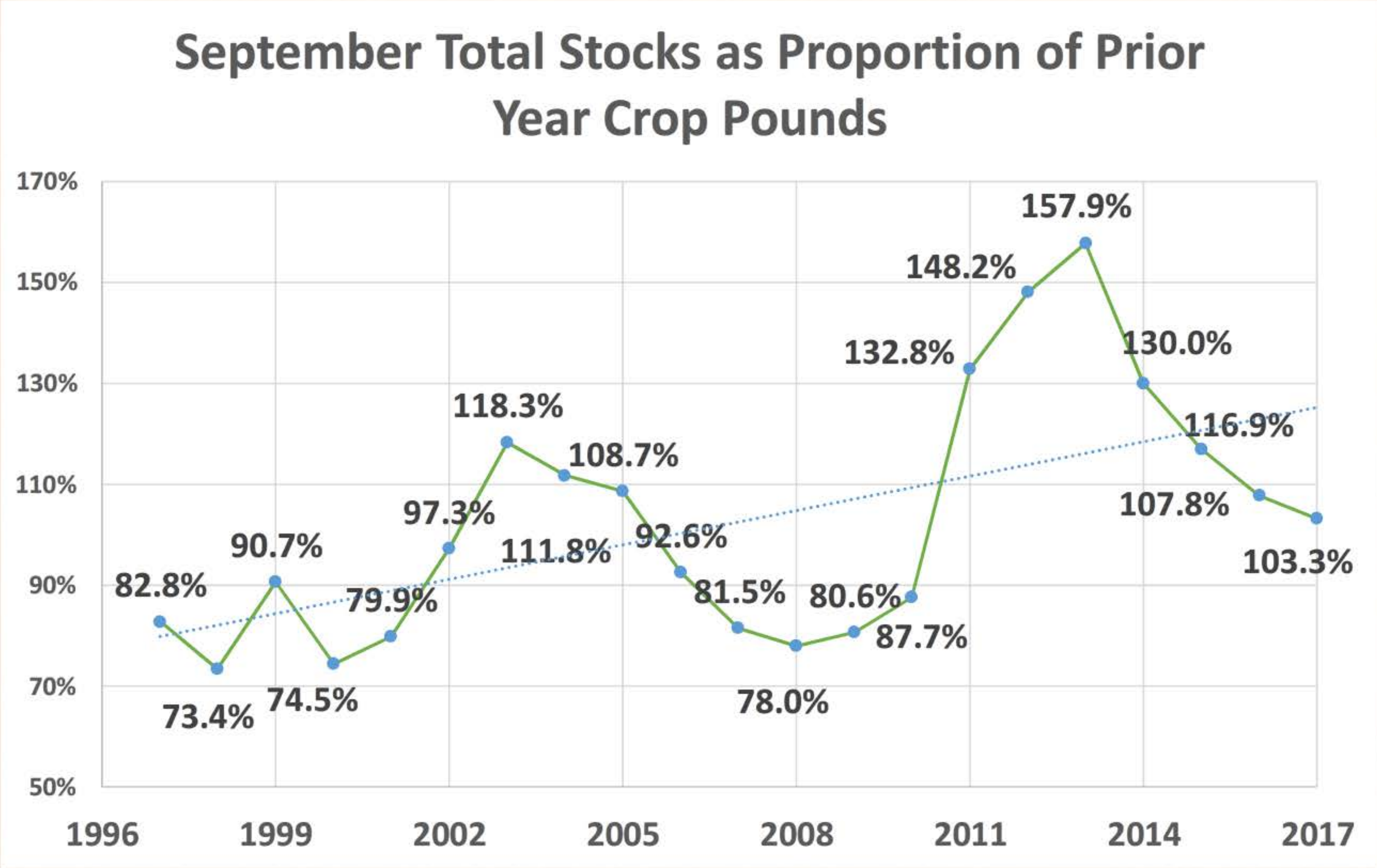
- Each Crop lasts one year, starting in September and ending at the end of the following August
- September stocks represent "Carryout" of previous year crop
- Treat inventories on an accrual or running basis
- Controlling stocks for crop size is crucial

U.S. Hop Stocks Analysis



USDA-NASS September 2017 Hop Stocks Report

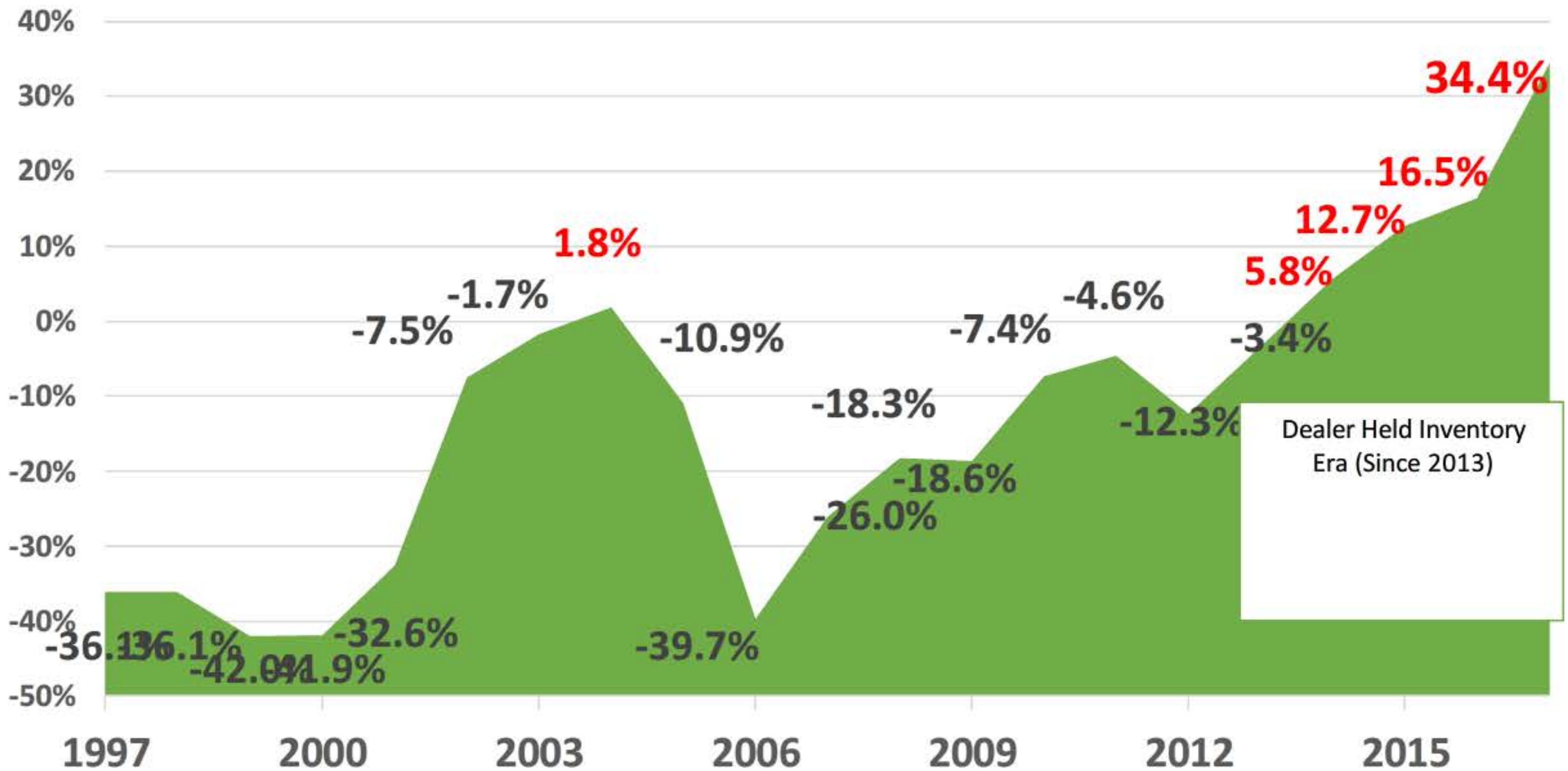
U.S. Hop Stocks Analysis



Data from USDA-NASS September 2017 Hop Stocks Report

U.S. Hop Stocks Analysis

September Dealer & Grower Stocks Less Brewer Stocks As A Proportion of Prior Year Crop



Data from USDA-NASS September 2017 Hop Stocks Report

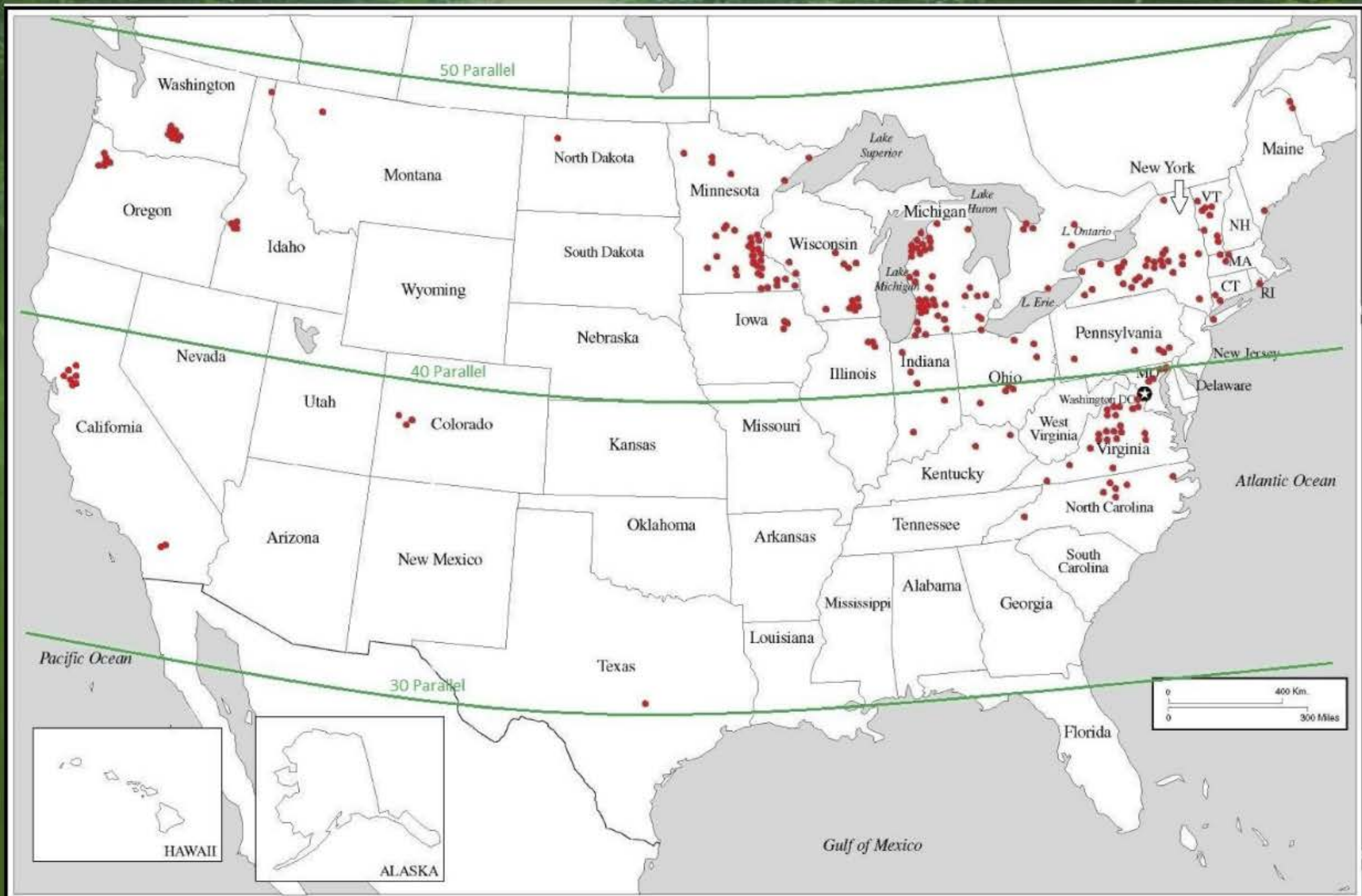
Conclusions and Looking Ahead

- 2017 Craft volume rose ~5-6% to ~25 MM bbls
- Craft hopping rates rates grew 2.7% to 1.54 ppb in 2016
- U.S. craft brewers use 83% U.S. grown hops
- Innovation in varieties continues to drive beer sales
- Galaxy (AU) is very important to U.S. craft brewers
- USDA public breeding will get a boost in 2018 and beyond, will need additional funders
- Hop Industry investing effort to achieve favorable federal outcomes

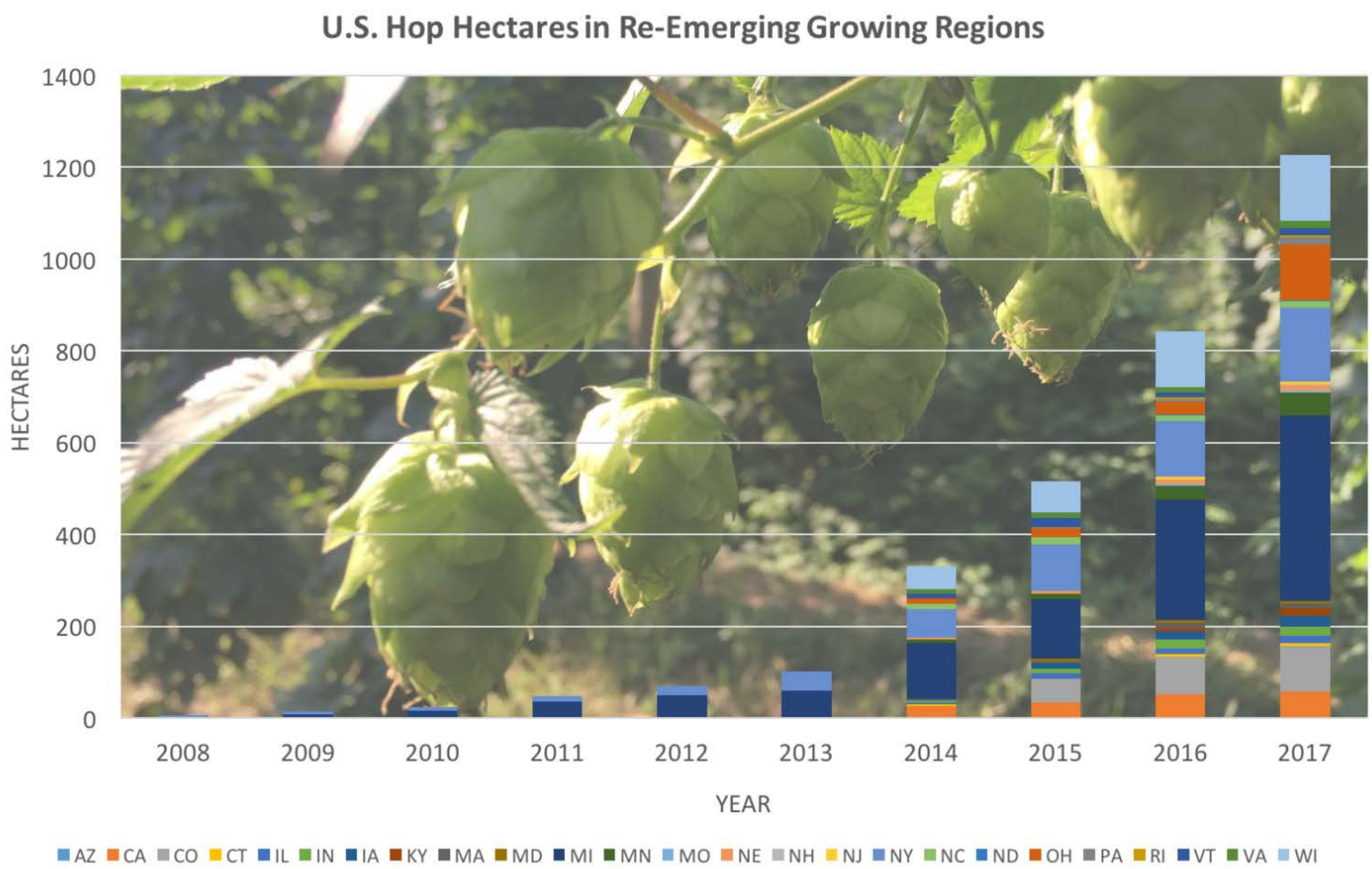
50th Parallel

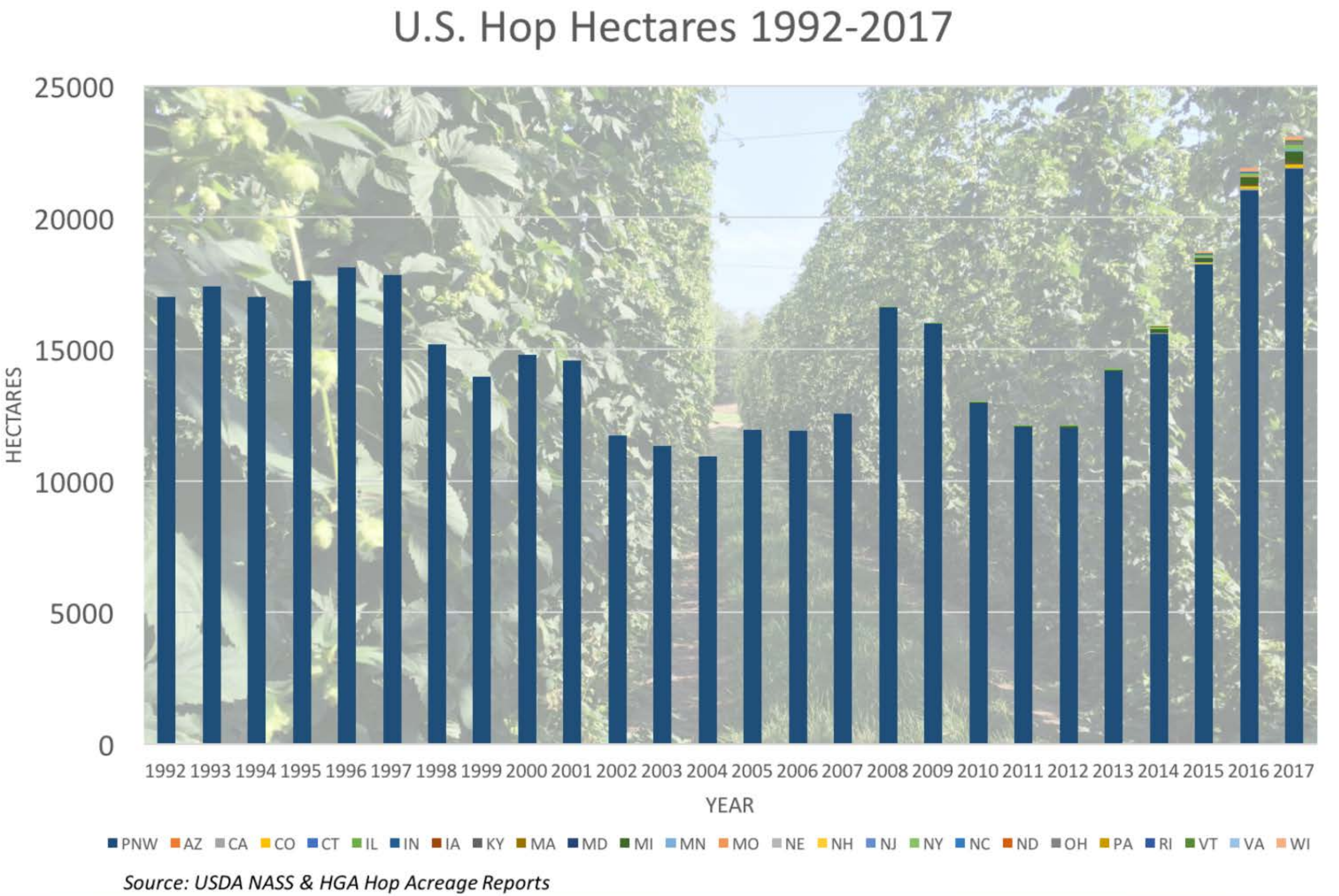
40th Parallel

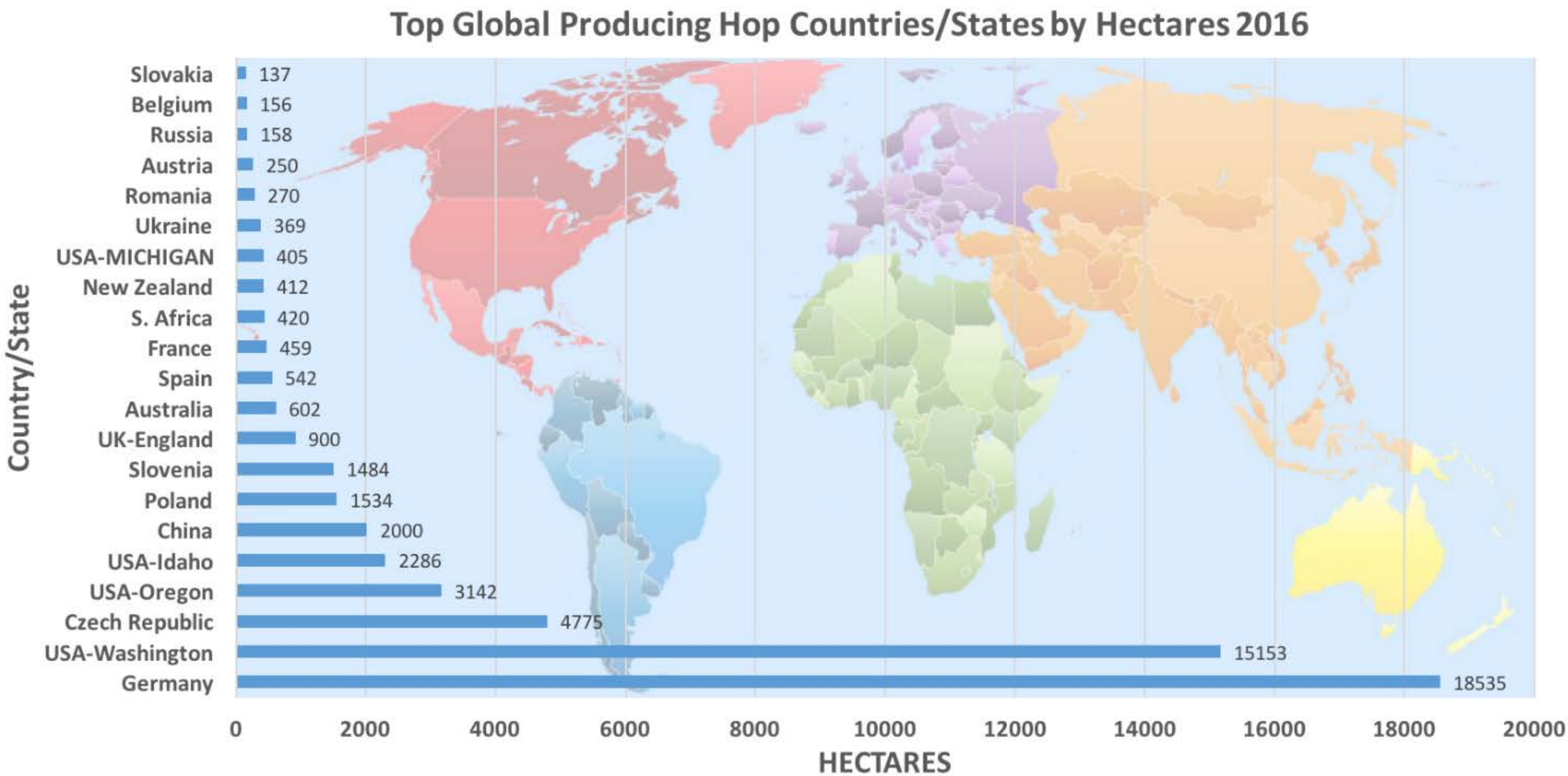
30th Parallel



HAAS®


U.S. Hop Hectares in Re-Emerging Growing Regions
1400
1200
1000
800
600
400
200
0
HECTARES
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
YEAR
AZ CA CO CT IL IN IA KY MA MD MI MN MO NE NH NJ NY NC ND OH PA RI VT VA WI


U.S. Hop Hectares 1992-2017
25000
20000
15000
10000
5000
0
HECTARES
1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
YEAR
PNW AZ CA CO CT IL IN IA KY MA MD MI MN MO NE NH NJ NY NC ND OH PA RI VT VA WI
Source: USDA NASS & HGA Hop Acreage Reports



Source: Hop Growers of America. 2016 Statistical Report. January 2017. Version 2.

Blue Stars - Growers who have confirmed hop varieties and contact information.

Green Stars - Growers who have more than 10,000 plants and have confirmed hop varieties.

Yellow Stars - Great Lakes Hops!

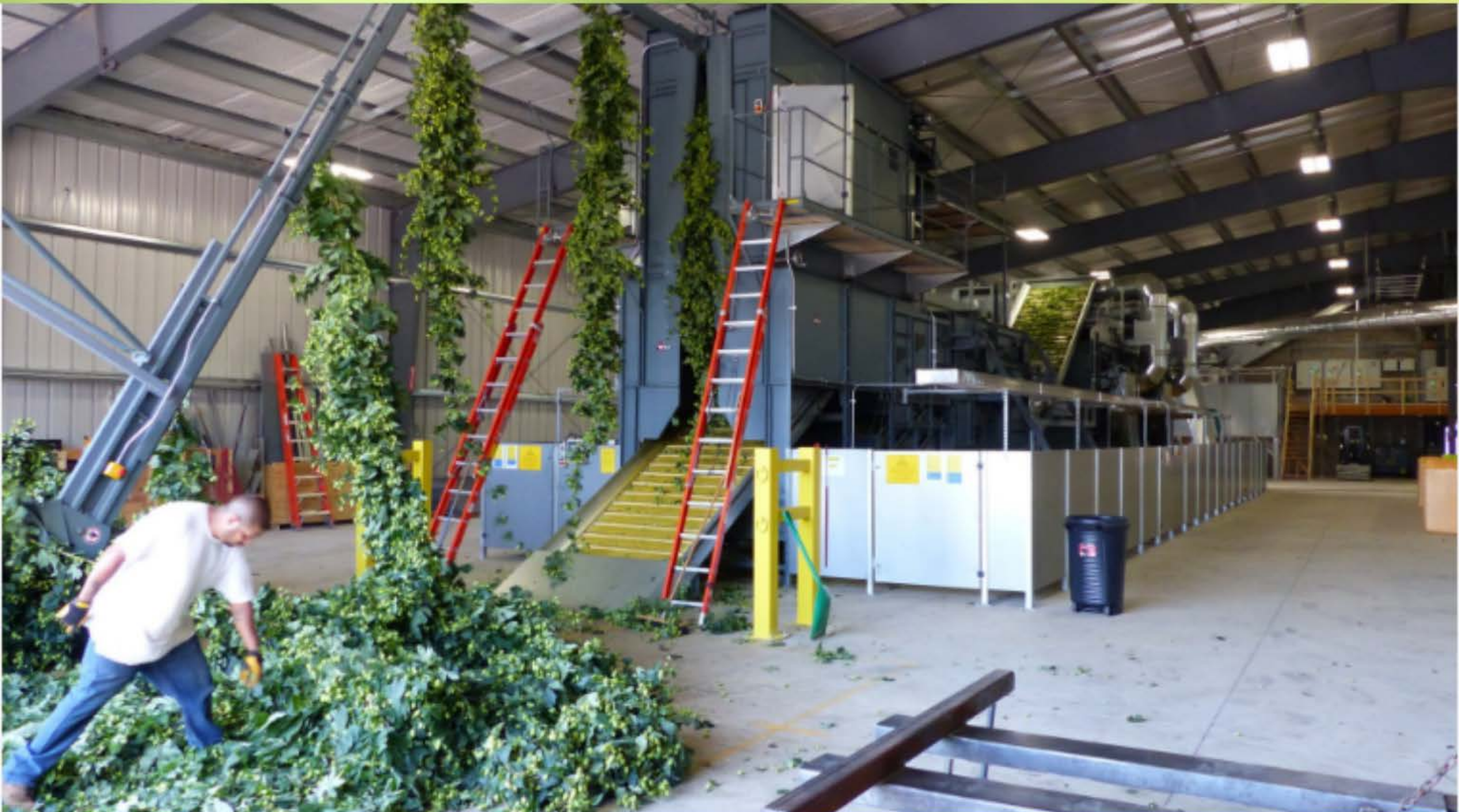
Diamonds - Research centers and Universities.

Circles - Growers who have not yet confirmed data. (Turn me into a star!)


Challenges: Lack generations of production knowledge
1. Horticultural (pests, disease, and mgmt) and control options
2. Infrastructure development
3. Capital-upfront costs
4. Post harvest (right sizing dryer, proximity to picking, marketing and sales, etc)



MI LOCAL HOPS
ABOUT
TEAM
HOP VARIETIES
CONTACT



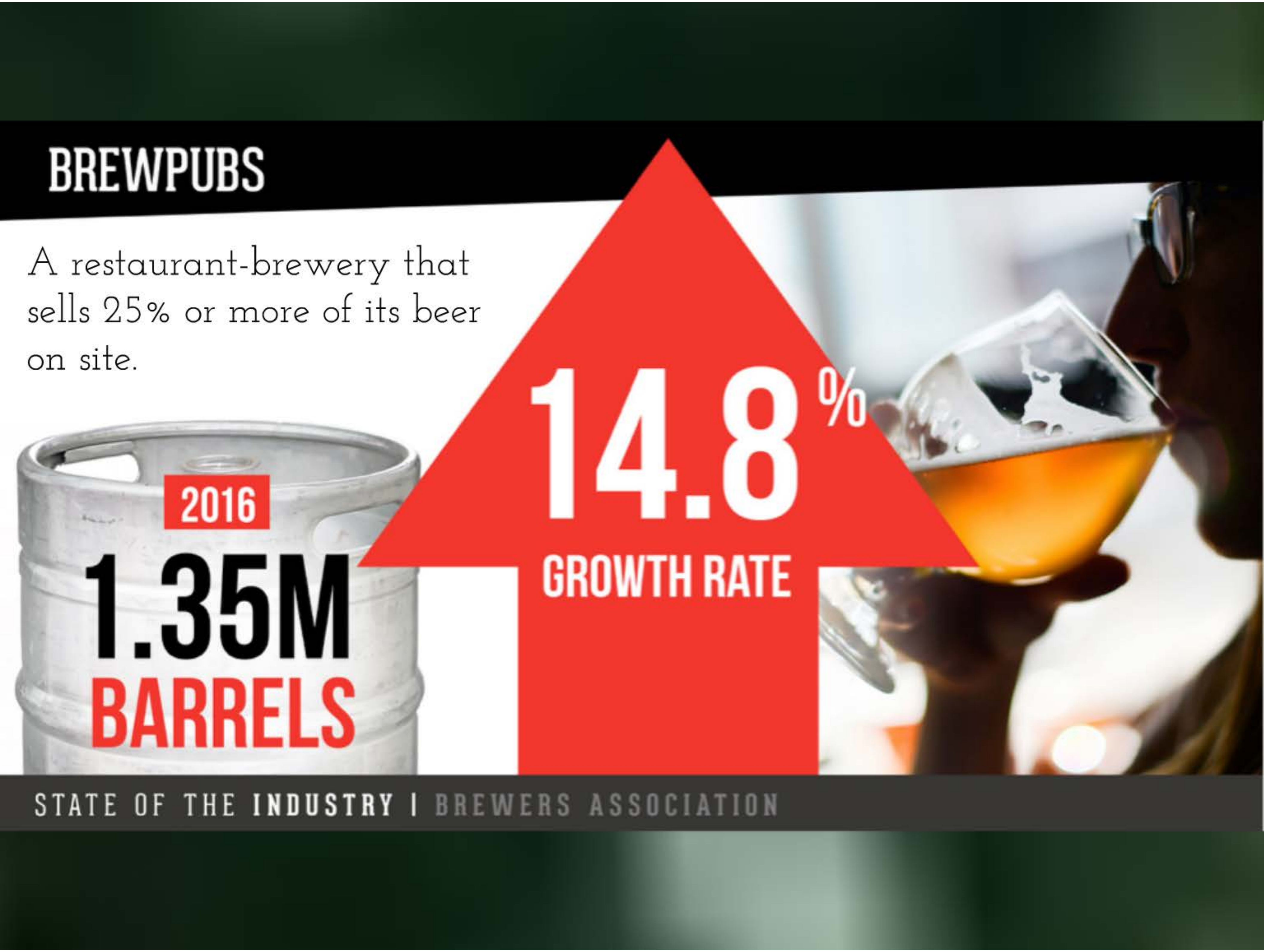

MI LOCAL
HOPS
CONTACT


MI LOCAL
HOPS
ABOUT
TEAM
HOP VARIETIES
CONTACT


CSL
CSL
NISSAN


CAUTION
STRONG MAGNET


06-501-007-CAS
06-501-020-CAS
CASCADE


BREWPUBS
A restaurant-brewery that sells 25% or more of its beer on site.
2016
1.35M
BARRELS
14.8%
GROWTH RATE
STATE OF THE INDUSTRY | BREWERS ASSOCIATION

MICROS

> 15,000 barrels (17,600 hectoliters) of beer per year with 75% or more of its beer sold off-site

2016

5.0M

BARRELS

27%

GROWTH RATE

REGIONALS

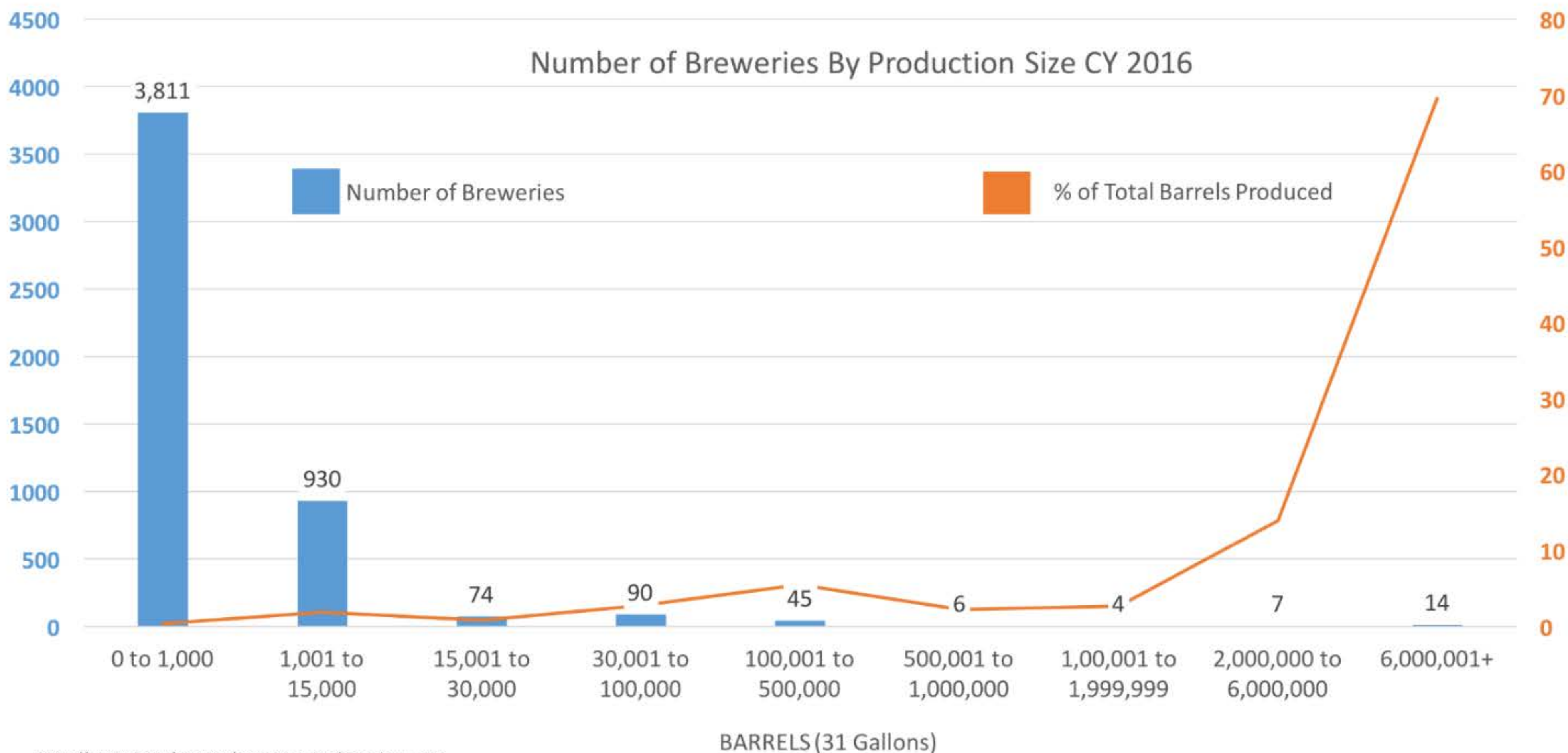
Annual beer production of between 15,000 & 6,000,000 barrels

2016

17.94M BARRELS

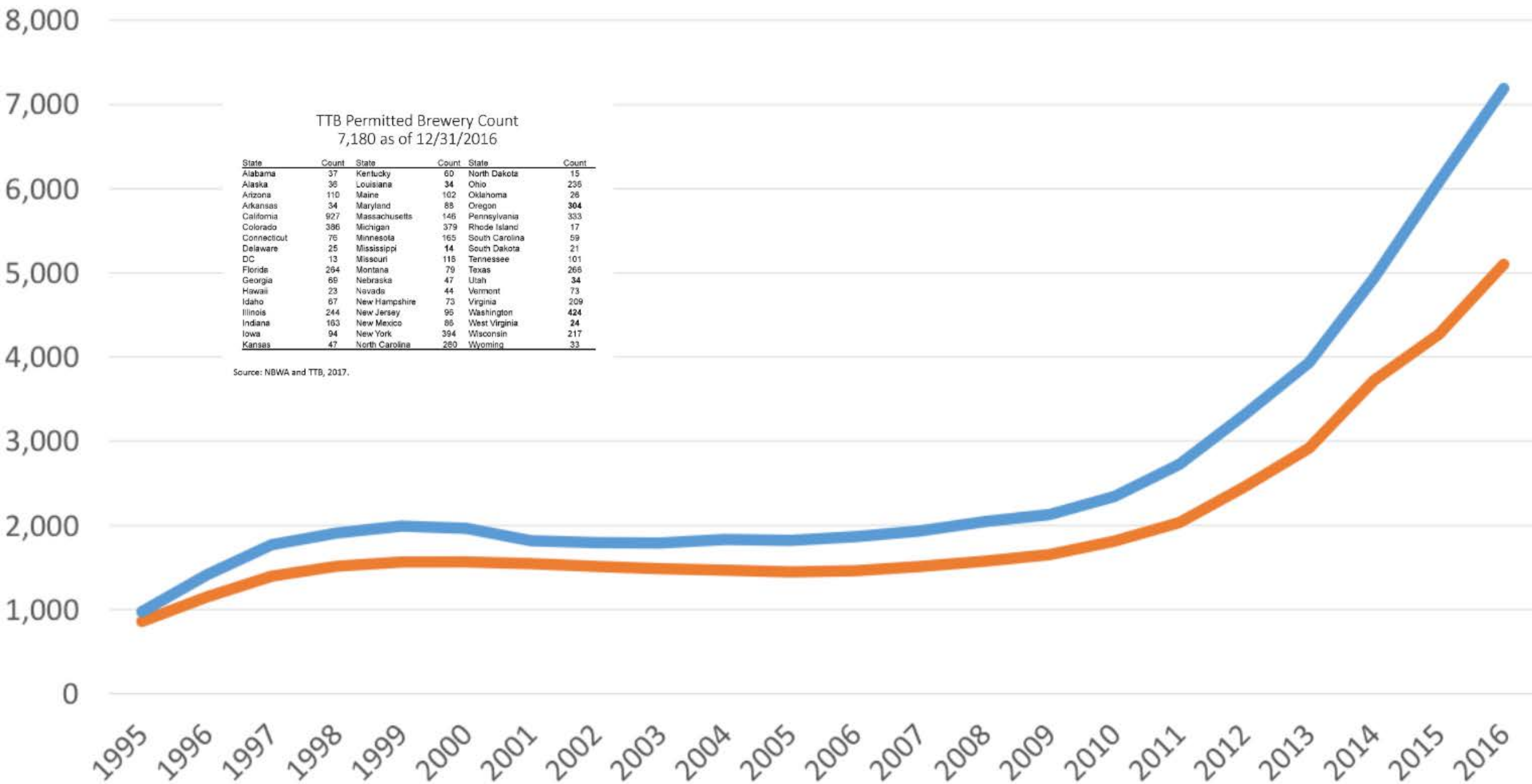
0.9% GROWTH RATE


PRICING
$1.02
PRICE INCREASE
+2.9%
Average case price in 2016: $36.18
STATE OF THE INDUSTRY | BREWERS ASSOCIATION
Source: IRI Group, MULO+C



https://www.ttb.gov/statistics/production_size/2016_brew_pro

Breweries and Brewery Permits, 1995-2016



TTB Permitted Brewery Count
7,180 as of 12/31/2016

State	Count	State	Count	State	Count
Alabama	37	Kentucky	60	North Dakota	15
Alaska	36	Louisiana	**34**	Ohio	235
Arizona	110	Maine	102	Oklahoma	26
Arkansas	34	Maryland	88	Oregon	**304**
California	927	Massachusetts	146	Pennsylvania	333
Colorado	386	Michigan	379	Rhode Island	17
Connecticut	76	Minnesota	165	South Carolina	59
Delaware	25	Mississippi	**14**	South Dakota	21
DC	13	Missouri	116	Tennessee	101
Florida	264	Montana	79	Texas	266
Georgia	69	Nebraska	47	Utah	**34**
Hawaii	23	Nevada	44	Vermont	73
Idaho	67	New Hampshire	73	Virginia	209
Illinois	244	New Jersey	95	Washington	**424**
Indiana	163	New Mexico	86	West Virginia	**24**
Iowa	94	New York	394	Wisconsin	217
Kansas	47	North Carolina	260	Wyoming	33

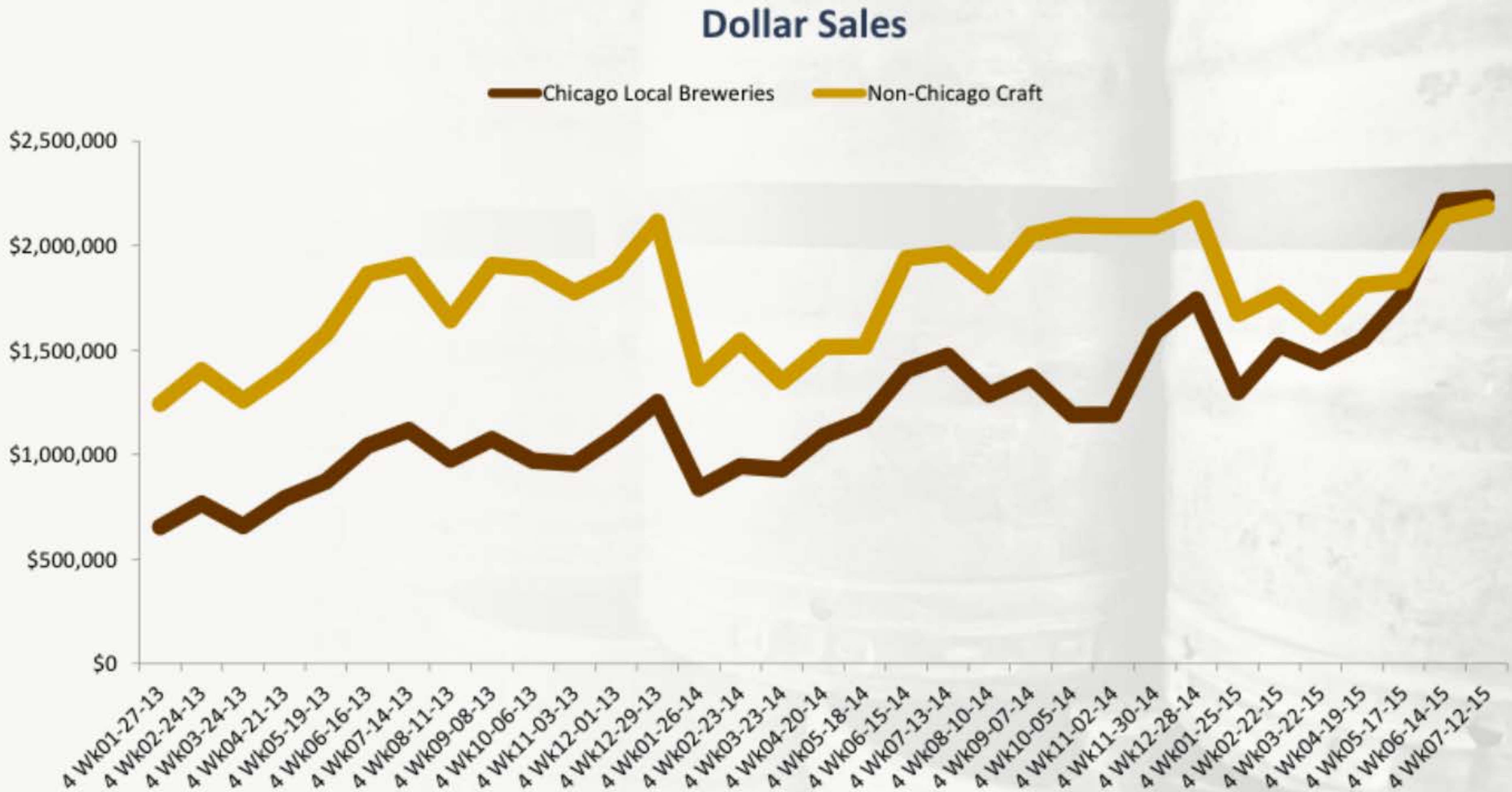
Source: NBWA and TTB, 2017.


WHAT'S
HOT
ALL CONCEPT TRENDS
CULINARY CONCEPTS
1 Hyper-local sourcing
2 Natural ingredients/clean menus
3 Environmental sustainability
4 Locally sourced produce
5 Locally sourced meat and seafood
NATIONAL RESTAURANT ASSOCIATION
Restaurant.org


WHAT'S HOT
ALCOHOLIC BEVERAGES
1 Craft/artisan spirits
2 Onsite barrel-aged drinks
3 Locally produced wine/spirits/beer
4 Regional signature cocktails
5 Culinary cocktails
ALL BEVERAGE TRENDS
NATIONAL RESTAURANT ASSOCIATION

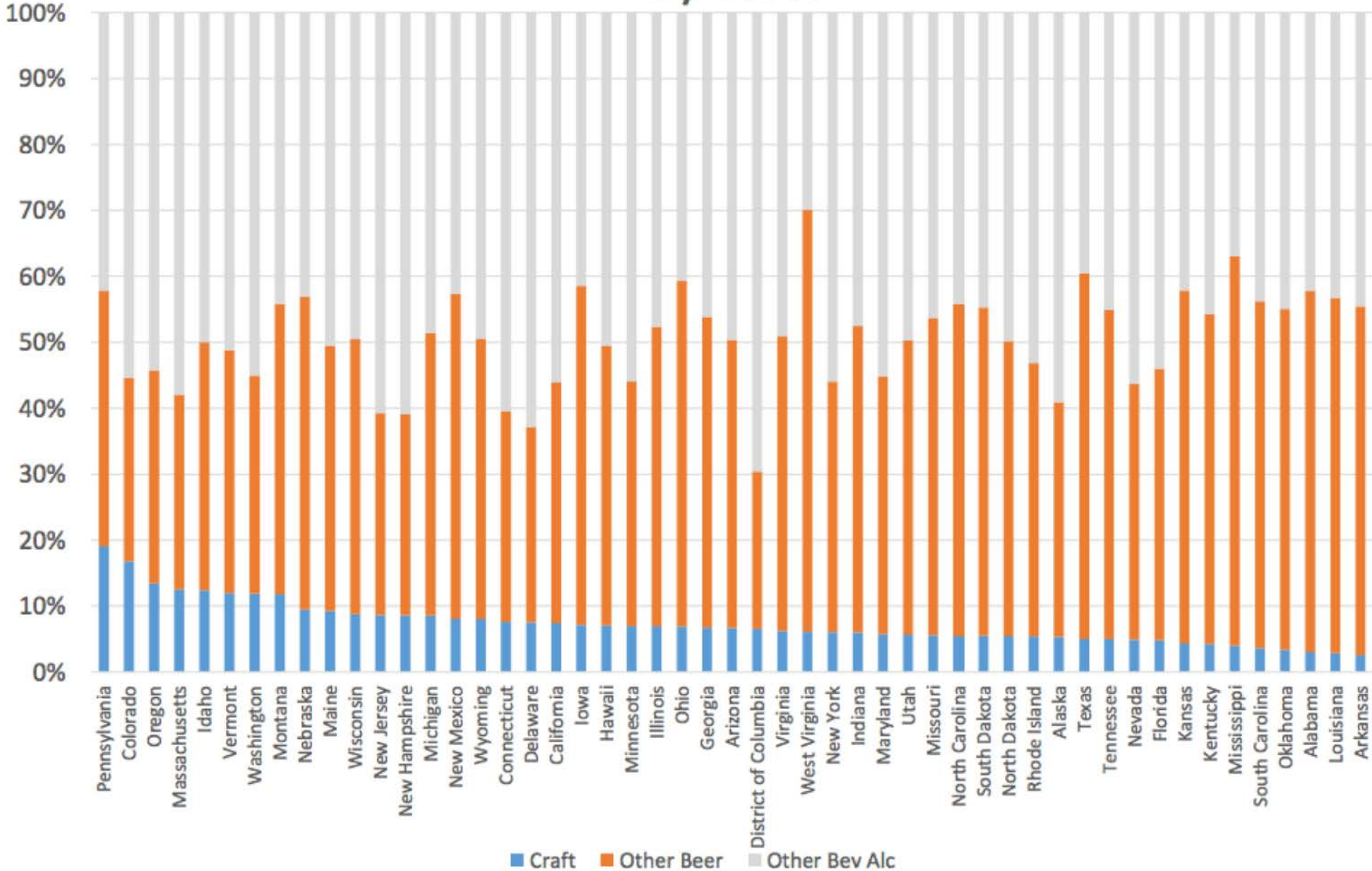
Local Craft vs Other craft Vendors
Chicago Supermarkets

- **Local Craft Brewers Dollar Sales passed up Non-Local Craft Brewers earlier this year**



Source: IRI InfoScan IRI Chicago, IL FODO Market Quad Weeks Jan 27, 2013 through July 12, 2015

Craft Brewer/Beer Share of Beverage Alcohol By State




PALEOOZA
PALEOOZA
PALEOOZA
Michigan Pale Ale
OUR CLASSIC PALE ALE, WITH MICHIGAN GROWN, CASCADE HOPS. BRIGHT HOPPINESS AND PLEASANT AROMATICS FRAMED WITH BALANCING SWEETNESS OF PALE MALTS.
PAIRINGS: SPICY DISHES, HARD CHEESES, GREENS.
ENJOY AS YOU PLEASE AND FOR YOURSELF.
STOP & TASTE
NEW HOLLAND BREWING
NEW HOLLAND BREWING

PALM READER

Available in Michigan only. A tribute to our beautiful state, this refreshing ale is made with Michigan-grown Crystal and Zuper-Saazer hops. Derived from Saaz, a traditional noble hop hailing from the Czech Republic, these Zuper-Saazer hops, grown locally at Hophead Farms, impart intense and fruity aromas. Combined with the citrus notes of the Crystal hops and the simple malt bill, this beer is crisp, bright and delicious.

ABV: 5.4%

IBUs: 45

RateBeer Rating: 89

Availability: May

ON TAP

DRAFT 6 PACK

FIND OUR BEER


ROGER


2017 MI Chinook Cup
1. MI Local
2. Empire Hops
3. Top Hops
The Chinook Cup
Est. 2017
Champion

The Hop Quality Group proudly presents the 6th annual

CASCADE CUP

1st place- Morrier Ranch, Washington
2nd place- CLS Farms, Washington
3rd place- B & D Hop Farm, Oregon
4th place- Hop Head Farms, Michigan

2017

Beer Reviews

Luponic Distortion's Newest Features Michigan Hops

By Pat Evans

June 2, 2017

......In contrast to the piney, grapefruit notes Brynildson has imprinted in his head for the Pacific Northwest grown hop, he found more Mandarin orange in the Michigan grown cones. It is a showcase of terroir and how a difference of 2,000 miles can distinctly influence a hop. “I was really blown away, not just in quality but how distinct they were to those grown in the Northwest,” he said. “These hops were bordering on tropical, I wasn’t familiar with that from Chinooks. It was a pleasant surprise.”

He said the Michigan hop emergence is surprising, especially for an “old time” brewer like him, who has long felt the new emerging hop regions might never hold their weight. As hop regions pop up, Brynildson said the first few years might be the most luscious, as hops are nutrient rich, so fresh soil might be best. “It’s a legit growing region,” Brynildson said of Michigan. “A lot of us, especially old timers, we thought these new hop growing regions weren’t going to have a huge impact mostly because of scaling and pricing. But this little experiment changed my mind all together.”

https://oct.co/essays/luponic-distortions-newest-features-michigan-hops growing regions weren't going to have a huge impact mostly because of scaling and pricing. But this little experiment changed my mind all together."

https://oct.co/essays/luponic-distortions-newest-features-michigan-hops

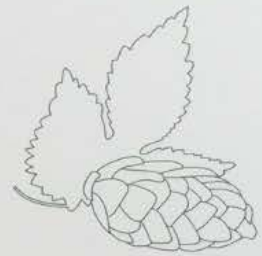
LUPONIC DISTORTION 006

MAY 2017 - SEPT 2017

Revolution No. 006 is driven by a mix of seven different hop varieties, and is the first-ever West Coast beer to focus on Michigan-grown hops. "This beer showcases what happens when you take two familiar Northwest hop varieties and grow them 2,000 miles to the east," says Brewmaster Matt Brynildson. "The typical piney, dank attributes of these hops are transformed into something much brighter, with a racy citrus quality that adds yet another new layer to the lore of Luponic Distortion."

Cream
Raspberry
Peach
Passion fruit
Citrus

Cascade



Cascade / USA
Cascade / Australia
Cascade / Germany / Hallertau
Cascade / Germany / Hersbruck
Cascade / UK
Cascade / New Zealand

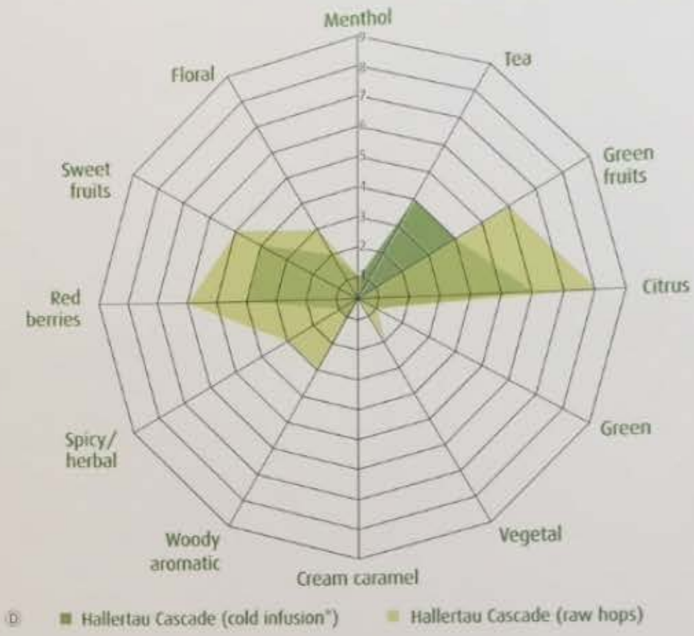
The Cascade cultivar takes its name from the Cascades, a mountain range of volcanic origin in the USA. The Cascade variety was bred in Oregon as part of the USDA breeding programme and released in 1972. The typical features of Cascade are its long, dark-green cones and its relatively low alpha acid content. Cascade has a very pleasant fruity, citrus-like aroma and is the most popular variety among US craft brewers.

Cascade

* for the cold infusion 2 gr of pellets was dissolved to 200 ml water (20 °C) for 30 min and subsequently evaluated in order to simulate to some extent the change in aroma through dry hopping.

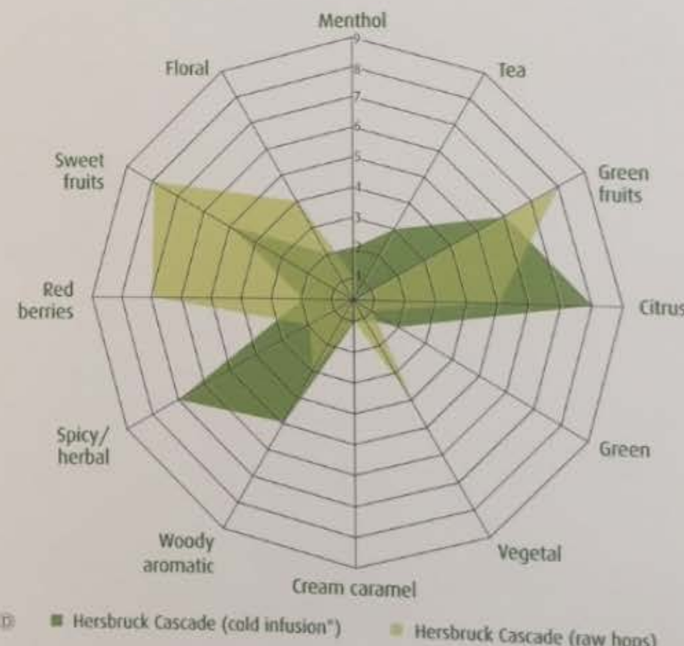
Cascade
Germany / Hallertau

In the raw hops, fresh grapefruit comes to the forefront, accompanied by green fruits, such as grapes and quince, but also with sweet pineapple combined with red berries – with a distinct raspberry sauce character. In the cold infusion, the overall profile is augmented by fine tea aromas.



Cascade
Germany / Hersbruck

The cold infusion features refreshing citrus aromas, green fruits and spicy-herbal elements, as well as notes of passion fruit. In the raw hops, sweet and green fruits such as quince predominate in combination with lilac and vegetal top notes. The aroma of coffee is particularly pronounced.



* for the cold infusion 2 gr of pellets was dissolved to 200 ml water (20 °C) for 30 min and subsequently evaluated in order to simulate to some extent the change in aroma through dry hopping.

Cascade

■ Cascade USA (cold infusion*) ■ Cascade USA (raw hops)

■ Cascade Australia (cold infusion*) ■ Cascade Australia (raw hops)

Cascade USA

The distinguishing features of this variety are its long, dark-green cones and its low alpha content. In the cold infusion, citrus aromas come strongly to the fore, whereas cream caramel and fruity notes of blackberries and mango predominate in the raw hops. Due to its optimal cultivation characteristics and good resistance to downy mildew, Cascade produces high yields. The Cascade variety is very popular for use in US-American craft beers, particularly for India Pale Ales.

Cascade Australia

In both the raw hops and the cold infusion, this cultivar features sweet fruity aromas of peach and plum, as well as red berries, such as cassis and raspberries. These give it a particularly juicy flavour. The overall impression is rounded off by notes ranging from spicy-herbal to cream caramel. Strong citrus aromas of grapefruit and bergamot create a delightful contrast and impart a special flavour to the beer.

Chinook

Washington/
Oregon

Fennel
Basil
Elderberry
Lychee
Red berries

This cultivar takes its name from a Native American tribe indigenous to the region around Washington.

It was developed in Washington State within the framework of the USDA breeding programme and was released as a high-alpha variety in 1985. The female parent of this variety is the English Golding. Chinook is characterised by strong growth in all growing regions and produces its highest yields in the Yakima region. In its raw state, this hop has a herbal, almost smoky, character, reminiscent of tarragon, juniper, basil and lavender, held together by a well-balanced citrus note. In the cold infusion, red berries, sweet fruits and floral elements predominate – with resiny pine essences completing the sophisticated aroma spectrum.

■ Chinook (cold infusion*) ■ Chinook (raw hops)

Descriptor	This includes the following aromas:
Menthol	Mint, melissa, sage, metallic, camphor
Tea	Green tea, camomile tea, black tea
Green fruits	Pear, quince, apple, gooseberry, wine yeast, ethereal
Citrus	Grapefruit, orange, lime, lemon, bergamot, lemon grass, ginger
Green	Green-grassy, tomato leaves, green peppers
Vegetal	Celeriac, leek, onion, artichoke, garlic, wild garlic
Cream caramel	Butter, chocolate, yoghurt, gingerbread, honey, cream, caramel, toffee, coffee
Woody aromatic	Tobacco, cognac, barrique, hay, leather, tonka, woodruff, incense, myrrh, resin
Spicy/herbal	Lovage, pepper, chilli, curry, juniper, marjoram, tarragon, dill, lavender, aniseed, liquorice, fennel
Red berries	Cassis, blueberries, raspberries, blackberries, strawberries
Sweet fruits	Banana, watermelon, honeydew melon, peach, apricot, passion fruit, lychee, dried fruit, plum, pineapple, white jelly bears
Floral	Elderflower, camomile blossom, lily of the valley, jasmine, apple blossom, rose, geranium

* for the cold infusion 2 gr of pellets was dissolved to 200 ml water (20 °C) for 30 min and subsequently evaluated in order to simulate to some extent the change in aroma through dry hopping.

[illegible]	
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
Alpha acids*	[illegible]
Beta acids	[illegible]
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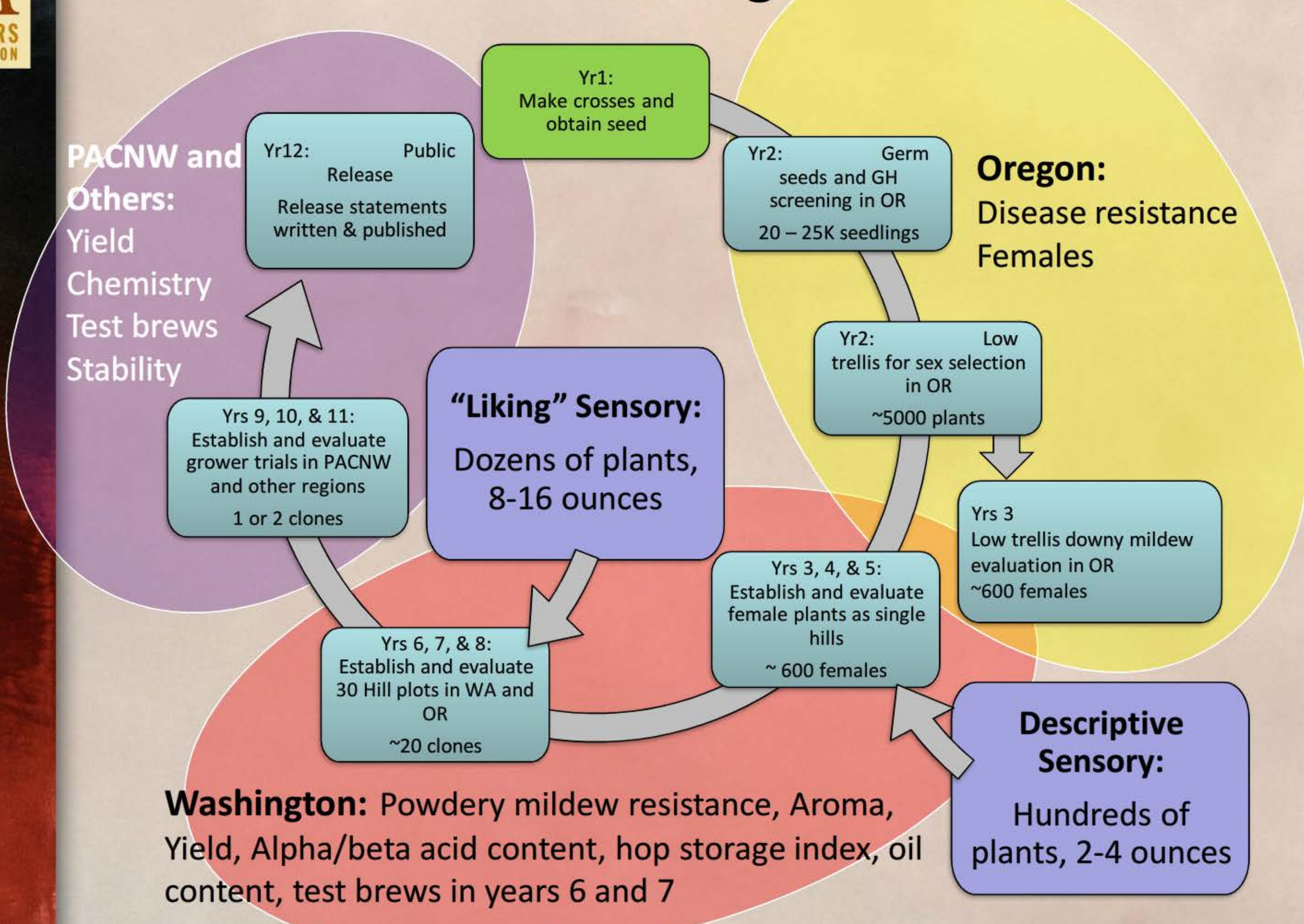
USDA Public Breeding



2016 MDARD Specialty Crop Block Grant.
Hop Quality Improvement, Training and Verification Program. $76,415

Great Lakes HOP & BARLEY CONFERENCE

Great Lakes Hop and Barley Conference 2018

Join us for the fourth annual conference, March 12-14 at the Radisson Plaza Hotel and Suites in Kalamazoo, Mich.

https://events.anr.msu.edu/GLHBC2018/

Conclusions

Growers in the Pacific Northwest and Germany grow over 75% of the world's hops, and this will not change anytime soon.

Provided new growers can produce high quality hops at a reasonable price, as more consumers are introduced to craft beer, their desire for flavor, variety, and "local" will continue to drive demand for hops in re-emerging and new growing regions.

As craft beer expands overseas, there is opportunity for increasing exports.

Variety is the key, which makes it difficult for producers growing a perennial plant.

UVM, MSU, other universities have been working the last several years to develop a "pre-breeding program" and test the terroir of existing varieties in different locations to support producers outside the PNW.


Craft beer trends and the state of Michigan hops
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