

American Noble Hops™

Hop Aroma Expression and Character with YCH American Noble Hops™



Annie Johnson
Homebrewer – Hop Whisperer

Introduction

Who am I and why am I here?

Annie Johnson

2013 AHA Homebrewer of the Year
Pilsner Urquell Master Hombrewer
PicoBrew, Inc. Brewmaster/Distiller
BJCP National
Oakland A's fanatic

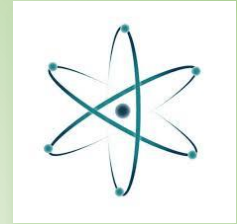


Seminar Goals

- Gain better understanding of American Noble Hops™ as a replacement for traditional Noble hops
- Talk about and drink up samples of lagers brewed with Loral, Palisade®, Simcoe® and Mosaic®/Citra® noble hops
- Does it really matter what hop I use in my lagers?

Seminar Goals

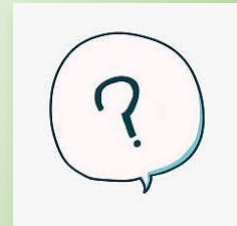
› What we know



› What we *think* we know



› What we're still trying to figure out about hops and utilization



All Hail the Hop!

Major components influencing beer aroma/flavor	Concentration (% w/w)
Humulones (α -acids) ⁹¹	2-23
Humulinones ^{21,25}	0.1-0.5
Polyphenols/ Tannins ⁹¹	3-6
Hulupones ²⁵	0.05
Lupulones (β -acids) ⁹¹	2-10
Essential Oil ⁹¹	0.5-4.0
Aroma Precursors (Thiol precursors, ³² aglycons, ³³ geranyl esters ⁶²)	0.013-0.053 (0.006-0.002, 0.0004-0.015, 0.003-0.036)
Monosaccharides (glucose, fructose) ⁹⁷	2-4 (0.38-0.55, 0.32-0.44)
Organic Acids (succinic, malic, citric) ⁹⁷	?
Metal ions (Fe, Mn, Zn, and Cu) ⁸⁹	0.03-0.06
Lipids and fatty acids ⁹¹	1-5
Hop (or microorganism?) enzymes ^{101-102, 106}	?
Overall importance for hop derived bitterness	Overall importance for hop derived aroma
More	Less More Less

Anatomy and composition of the hop cone adapted from Benitez et al. and Biendl. From MBAA TQ vol. 56, no. 1, 2019



What's Common Among All Lager styles?

- › Early, mid and flame out hop additions
- › Pilsner malt - other malts
- › Noble Hops Tettnang Saaz Hallertau Spalt
 - Traditional noble hop flavors
 - › Spice (medium to high)
 - › Floral (pleasant undertones)
 - › Earthy (mild – not dirty)
 - Less emphasis on bitterness, pine tar, grapefruit pith, other hoppy notes
 - Noble hop and ‘nearly Noble hops’ substitutes:
 - › English Fuggles, Liberty, Mt. Hood, Vanguard, and Willamette
 - › East Kent Golding, Hersbrucker, and Styrian Goldings They have characteristics that are similar to the true noble hops, but they just aren't quite the same.



Hmm... now what?

Replace the Tettnang, Saaz, Spalt, Hallertau with YCH American Noble Hops™.

De-bittered Leaf is the concentrated bract of whole-leaf **hops** which has been separated from the lupulin glands. It is a high-quality, *low-alpha* product which retains variety-specific aroma and flavor characteristics and can be derived from **any** hop brand.

WHAT?!

Brew trials


Weyermann pilsner malt



3 one-ounce hop additions at 60, 15, and 10 mins

One ounce for 30 minute whirlpool at 180F


Saflager w-34/70


Noble Loral

Designed by annie 

A very pale, malty, medium-bodied American Lager with American Noble Loral hops  


Crafted on 8/9/19 by annie

Units: Imperial (Gallon, Pound, Ounces, °F) 

Style: BJCP 2015 : 1.B American Lager 

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Water


Batch Size: 3 Gal 

Starting Water: 3.91 Gal (32.61 lbs)




Water Amendments:

[+ Add Amendment](#)





Mash/Fermentables

Mash Type: Single Step Infusion With Mash Out 



Mash Steps:

	Temp(°F)	Time(min)	
Single Step Infusion Mash	152	90	
Mash Out	175	15	


Fermentables:

	Amount(lbs)	Color(pts)		
Weyermann Bohemian Pilsner Malt	5.5	2.0		


[+ Add Fermentable](#)

	Min	Actual	Max
OG	1.040	1.047 	1.050
FG	1.004	1.008	1.010
IBU	8	19 	18
SRM	2	2	4
ABV(%)	4.2	5.2	5.3


Grain Bill


Weyermann Bohemian Pils...

Boil/Whirlpool Hop Bill


Loral

Wort Curve Estimate



Water Chemistry

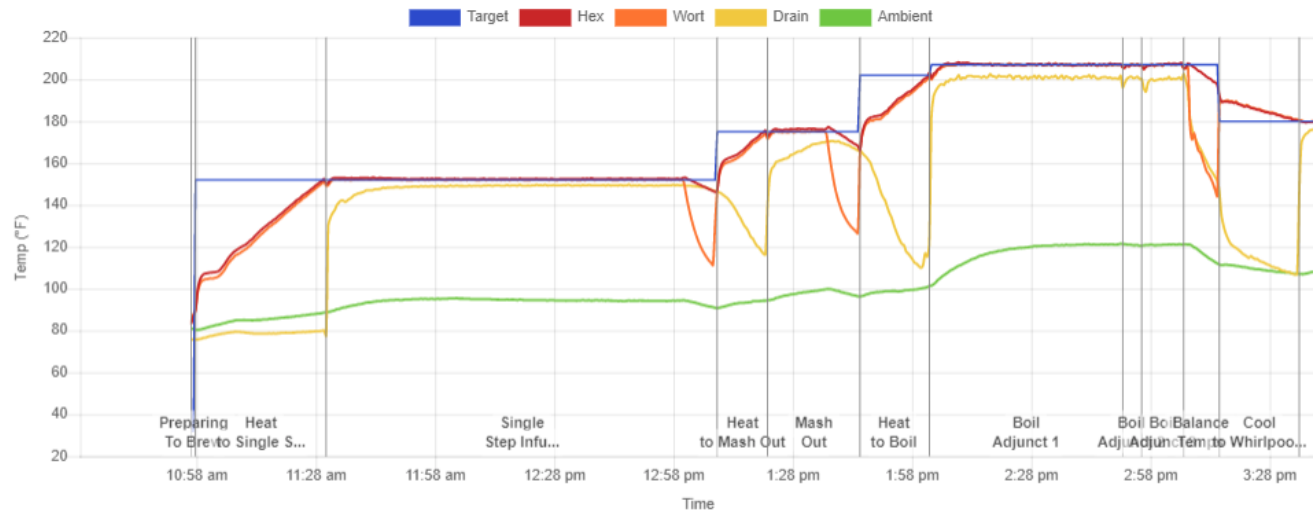
- › German pilsners sulfate to chloride ratio
 - 100ppm for **sulfate** and 85ppm for **chloride**.
 - German Pilsners greatly benefit from relatively high sulfate content in their water.
- › John Palmer also published a water spreadsheet with guidelines for the ratio. A summary is below:
- › 0-0.4: Too Malty
- › 0.4-0.6: Very Malty
- › 0.6-0.8: Malty
- › 0.8-1.5: Balanced
- › 1.5-2.0: Slightly Bitter
- › 2-4: Bitter
- › 4-9: Very bitter
- › 9+: Too bitter!
- › For a malty German Lager you would target something in the 0.4-0.6 range while keeping the overall sulfate levels low. Excessive levels of either sulfate or chloride can be harsh.
- › You can add more chloride to your water by adding Calcium Chloride (CaCl_2), and you can add sulfate by adding Gypsum (Calcium Sulfate or CaSO_4). Go light on the water additions, however, as it does not take many grams to significantly change the water content.
- › What's my local water look like
 - Can't always rely on water district's annual water report
 - › It's a weighted average of annual measurements
 - › 'your results may vary'
- › Use a water calculator!

Mash

- 152F single infusion with 175F mash-out

NOBLE LORAL Brewed On 8/9/2019

Temp vs Time



Pick a Lager Friendly Yeast

- › High attenuation in the 70 – 78% range
- › Med-high flocculation
- › Reliable low ester producer
 - Imperial Urkel
 - Wyeast Pilsner Urquell H-Strain 2001-PC
 - Fermentis Saflager w-34/70
 - WLP833 Bock lager
 - Ask your pro brewers!
- › Use a big fat FRESH yeast pitch



AMERICAN NOBLE HOP BEER SENSORRY

1. Palisade® = 1.1% AA
2. Loral® = 1.9% AA
3. Simcoe® = 2.2% AA
4. Citra®/Mosaic® = 3% AA/2.7% AA

Common characteristics: Floral, light citrus, spicy, fruity – what else?

Simcoe® Brand

YCR 14 CV.

BERRY, BUBBLE GUM, CITRUS,
EARTH, PASSION FRUIT, PINE

★★★★☆

Alpha:	2.1-27.3%
Beta:	0.6-8%
CO_H:	0-21%
Oil:	0.1-5.2 mL/100g

Loral® Brand

HBC 291 CV.

DARK FRUIT, FLORAL, LEMON-
CITRUS, PEPPER

★★★★☆

Alpha:	10-14%
Beta:	4.5-5.5%
CO_H:	0-24%
Oil:	1.5-3 mL/100g

Mosaic® Brand

HBC 369 CV.

BLOSSOMS, BLUEBERRY, BUBBLE
GUM, PAPAYA, ROSE, TANGERINE

★★★★☆


Alpha:	2.1-27.2%
Beta:	0.6-8%
CO_H:	0-25%
Oil:	0.1-5 mL/100g



SUMMARY

- › Imagine the possibilities of American Noble Hops™
- › Switching up beer styles: Kölsch becomes a Citra® Kölsch
- › Alternatives are a good – having a Plan B
- › You can still be an Old School Master
- › True innovation and not chasing trends separates the greats from the near-greats (which one are you?)

- › American Noble Hops™ - It is a high-quality, *low-alpha* product which retains variety-specific aroma and flavor characteristics and can be derived from **any** hop brand.



Take-Home

- › There are more bittering, flavor, and aroma contributions from hops than we traditionally describe
- › There is no easy one-size-fits-all method to shaping a great tasting beer

Continue to EXPERIMENT ON YOUR OWN and keep discovering new hop expressions

Homebrewing will never stop being FUN!

Thank You!

Questions?

Special thanks to Denny Conn, and **Yakima Chief Hops!**

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Twitter: @buffalowing

