



**Crisp Malt Webinar Series: Brewing the Perfect West Coast IPA**

**28/05/20**

Carl Heron

[Carl.Heron@Crispmalt.com](mailto:Carl.Heron@Crispmalt.com)

# Agenda

- A history of IPA
  - UK
  - USA
- What exactly is West Coast IPA
- West Coast IPA Styles
- American IPA ingredients
- Brewing an American IPA



## IPA – History - UK

- UK Government issue order to make a strong, heavily hopped pale ale at 6.5% abv packaged in Baltic oak barrels for Indian Colonists and soldiers
- Hodgsons brewery near the HQ of the East India Company get the business from 1750 to 1820
- Production starts in Burton in 1822 at Allsopps Brewery, Salt and Bass are not far behind
- Burton India Pale Ale has superior flavour, drinkability and clarity due to brewing water
- Taxes change and beer becomes weaker and less portable, breweries in India take over production



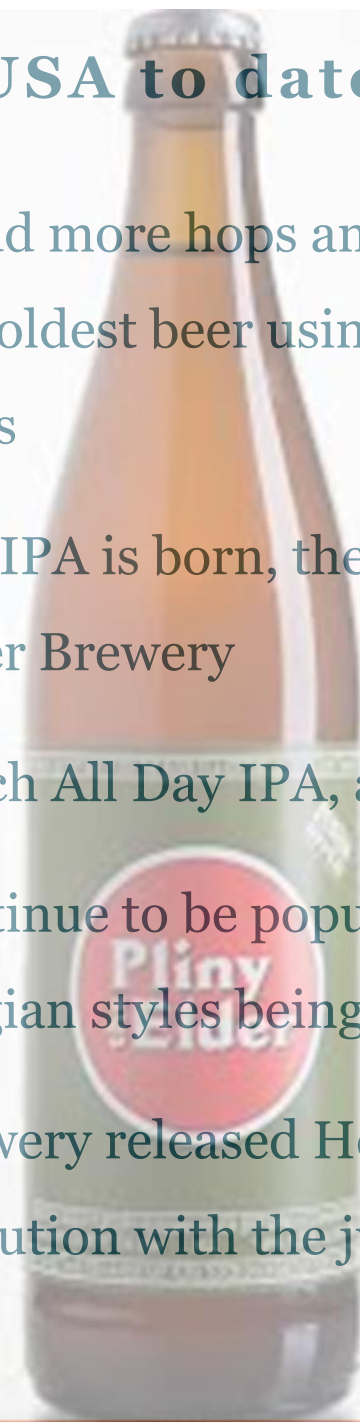
# IPA – History – USA early years

- More IPA exported from UK to USA than any other country
- North Eastern US brewers already making English style beers and soon make a copy of the India Pale Ales
- Production continues at full strength until the recession of the 1920's, prohibition finishes off all but a couple of breweries
- Ballantines is the last to produce in 1971 using oak vats and distilled hop oils
- Sierra Nevada and Anchor breweries may have started to use the Ballantine yeast and create super hoppy pale ales with Cascade as a dry hop in early 1980's
- Other breweries on the West Coast start to emulate the style and call it IPA



# IPA – History – USA to date

- Craft brewers start to add more hops and increase strength in the race to get the biggest, boldest beer using citrusy, piney and tropical fruit aroma hops
- The Double or Imperial IPA is born, the classic being Pliny the Elder from Russian River Brewery
- Founders Brewery launch All Day IPA, a more sessionable beer
- Big American IPA's continue to be popular all across the country with new Black and Belgian styles being created
- In 2011, Alchemist Brewery released Heady Topper, and so began the East Coast IPA revolution with the juicy, hoppy, less bitter style



# What exactly is a West Coast IPA?

- An IPA brewed on the Western coast of the USA, the term has been used for hoppy American IPA's to distinguish it from those brewed on the East Coast which are a completely different style
- Can be English style, USA contemporary, Double IPA's, Black IPA's or Belgian IPA's
- Originally created in the Western Seaboard States from the early 1980's through until now
- Green Flash Brewery trademarked it's "West Coast IPA"

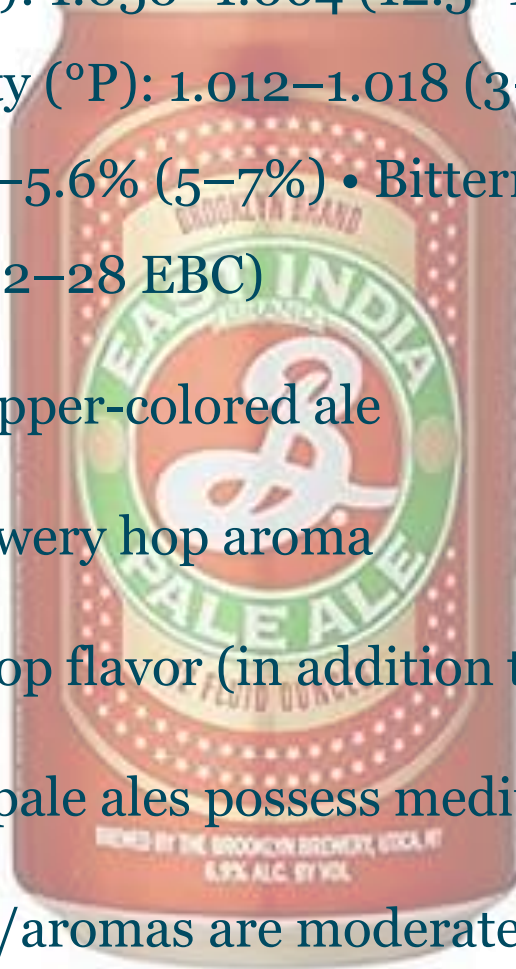


# Let's look at what a contemporary West Coast IPA should look and taste like?

- Strong bitterness with complex, dank, grassy hop aroma
- Relatively high final gravity giving balance to the bitterness and medium body
- Low levels of caramel sweetness or toastiness
- Fruity aroma, mainly from dry hopping
- Finish is long on bitterness then dry and crisp (from Burtonisation of the water)
- Not to be confused with juicy East Coast IPA's which are much less bitter and generally murky

# American IPA Styles- English Style

- Original Gravity (°P): 1.050–1.064 (12.5–15.7 °P) • Apparent Extract/Final Gravity (°P): 1.012–1.018 (3–4.5 °P) • Alcohol by Weight (Volume): 4–5.6% (5–7%) • Bitterness (IBU): 35–63 • Color SRM (EBC): 6–14 (12–28 EBC)
- Pale gold to deep copper-colored ale
- medium to high, flowery hop aroma
- medium to strong hop flavor (in addition to the hop bitterness)
- English-style India pale ales possess medium maltiness and body
- Fruity-ester flavors/aromas are moderate to very strong
- Often aged to add depth and a slightly tart finish





## American IPA Styles- Contemporary

- Original Gravity (°P): 1.060–1.075 (14.7–18.2 °P) • Apparent Extract/Final Gravity (°P): 1.012–1.018 (3–4.5 °P) • Alcohol by Weight (Volume): 5–6% (6.3–7.5%) • Bitterness (IBU): 50–70 • Color SRM (EBC): 6–14 (12–28 EBC)
- pale gold to deep copper-colored ale
- full, flowery hop aroma and may have a strong hop flavor (in addition to the perception of hop bitterness)
- India pale ales possess medium maltiness and body
- Fruity-ester flavors and aromas are moderate to very strong.
- Citrussy, piney, tropical fruit aroma hops typify this style

# American IPA Styles- Imperial or Double

- Original Gravity (°P): 1.075–1.100 (18.2–23.7 °P) • Apparent Extract/Final Gravity (°P): 1.012–1.020 (3–5 °P) • Alcohol by Weight (Volume): 6.0–8.4% (7.5–10.5%) • Bitterness (IBU): 65–100 • Color SRM (EBC): 5–13 (10–26 EBC)
- Imperial or double India pale ales have intense hop bitterness, flavor, and aroma must be fresh and lively, not harsh
- alcohol content is medium-high to high and notably evident
- deep golden to medium copper in color.
- balanced with complex alcohol flavors, moderate to high fruity esters, and medium to high malt character



## American IPA Styles- Black Ale

- Original Gravity (°P): 1.056–1.075 (14–18.2 °P) • Apparent Extract/Final Gravity (°P): 1.012–1.018 (3–4.5 °P) • Alcohol by Weight (Volume): 5–6% (6–7.5%) • Bitterness (IBU): 50–70 • Color SRM (EBC): 35+ (70+ EBC)
- medium high to high hop bitterness, flavor, and aroma
- medium-high alcohol content, balanced with a medium body
- Fruity, floral, and herbal character from hops of all origins
- style is further characterized by a moderate degree of caramel malt character and dark roasted malt flavor and aroma. High astringency and high degree of burnt roast malt character should be absent.

# American IPA Ingredients

- Extra Pale Malt – English for Imperial IPA's
- Munich and low colour crystal in West Coast IPA's for sweetness and malty depth
- De-husked roasted barley or extract for Black IPA's
- Water should be treated with Calcium Sulphate to enhance bitterness and dryness and Calcium Chloride to improve palate fullness, Sulphate:Chloride should be 2:1
- For English styles barrel quality is key for maturation, oak from the Baltic states is best



# American IPA Hops

- Cascade
  - released commercially in 1972, but was slow to be taken up
  - Fritz Maytag decided to use it in his Liberty Ale
  - As the Craft Brewing movement took hold, these citrusy hops were in high demand and this drove breeders to look more at aroma than bitterness
  - accounts for around 10% of the US hop production
- Aroma – Floral, Citrus, Grapefruit
- Alpha acid – 4.5 to 8.9%, Beta acid 3.6 to 7.5%
- Cohumulone – 33 to 40%
- Oil content 0.8 to 1.5ml/100g – 45 to 60% myrcene



# American IPA Hops

- Centennial
  - fuggle/Brewers Gold/East Kent Golding cross released in 1990
  - sometimes dubbed super cascade
  - One of the 4 C's along with Cascade, Chinook and Columbus all much loved for bittering IPA's
- Aroma – Earthy, Floral, Citrus
- Alpha acid – 9.5 to 11.5%, Beta acid 3.5 to 4.5%
- Cohumulone – 28 to 30%
- Oil content 1.5 to 2.5ml/100g – 45 to 55% myrcene



# American IPA Hops

- All the American IPA's showcase the aromatic US hops
- Hop breeders select based on lowest possible levels of cohumulone, above 30% they create a harsh bitterness
- High levels of Beta – acids are also avoided because the oxidation products of these that are formed during storage are very bitter and soluble in beer
- Amarillo, Citra, Simcoe, Ahtanum, El Dorado and many other varieties are sought after for the IPA's of today and any “new kids on the block” soon get brewed into a craft IPA to showcase their aromas



# American IPA Hop Selection and Quantity

- Cohumulone below 30%
- Beta-acid as low as possible
- Freshest possible un-opened hops
- The longer hops are boiled for the higher the isomerization of the alpha acids
- Higher gravity worts cause lower hop utilization
- Up to 30% of bitterness can be lost during fermentation
- Adding 50% more hops doesn't give a 50% increase in bitterness
- When selecting aroma hops look at the oil content and the percentage of myrcene, the higher the better





# Brewing a West Coast American IPA - Mashing

- Burtonise the water for mashing by adding brewing salts
- Use a well modified malt, preferably made from 2 row barley
- If brewing a double/imperial IPA use an English 2 row ale malt such as Maris Otter or Chevallier if you want a truly authentic taste
- Mash between 63 to 64°C for a regular IPA with a liquor to grist ratio of 2.7:1, stand for 60 minutes
- For a double/imperial IPA mash at 62°C and stand for at least 90 minutes to maximise fermentability



# Brewing a West Coast American IPA – Wort Boiling

- Fresh whole cone hops are best for aroma – do a seasonal IPA at hop harvest time to capture the liveliness of the newly picked cones.
- Type 90 pellets are the standard offering from hop merchants but they will also make type 45 pellets with 50% more lupulin gland material if you ask them to
- 60 minute boil, add hops at the start of boiling, 20 minutes into boil and once boiling is complete. Save the finest aroma hops for the last addition, and add more aroma hops to the whirlpool or hopback, preferably into wort below 85°C
- The Burton Brewers simmer boiled for 3 to 4 hours !



# Brewing a West Coast American IPA – Fermentation

- Choose a yeast that has high levels of  $\beta$ -glucosidase as these help boost hop aroma from dry hopping through biotransformation
- The yeast should be an ale strain with low to moderate ester production, west coast ale strains happen to ideal !
- Ensure that there's sufficient oxygen in the wort for yeast growth
- Pitch 1 million cells/milliliter wort/ $^{\circ}$ P of wort. For example, a 12  $^{\circ}$ P (1.048 SG) wort should be pitched at 12 million cells per milliliter of wort
- Manage the temperature so as not to get too much or too little growth



# Brewing a West Coast American IPA – Dry Hopping

- Can be done with hop cones tied into bags or with slurried pellets, T45 pellets are probably most cost effective as they have 50% more lupulin gland material
- Maximum flavour extraction from dry hopping is achieved after just 2 to 3 days
- Multiple dry hop additions with removal of the previous hop prior to adding next one is the best way to get aroma and flavour complexity
- Start as the fermentation is finishing and beer is put on crash cool
- Watch out for hop creep, best way to avoid this is to slurry the hops in hot liquor prior to addition



# Thank You

CARL HERON  
CRAFT BREWING SALES  
MANAGER

+44 (0)7771 954 205  
CARL.HERON@CRISPMALT.COM

JIM WIGGINS  
BSG SALES MANAGER  
SOUTH WEST

612-414-3445  
JWIGGINS@BSGCRAFT.COM

CRISPMALT.COM

