

Hallertau Hop Harvest

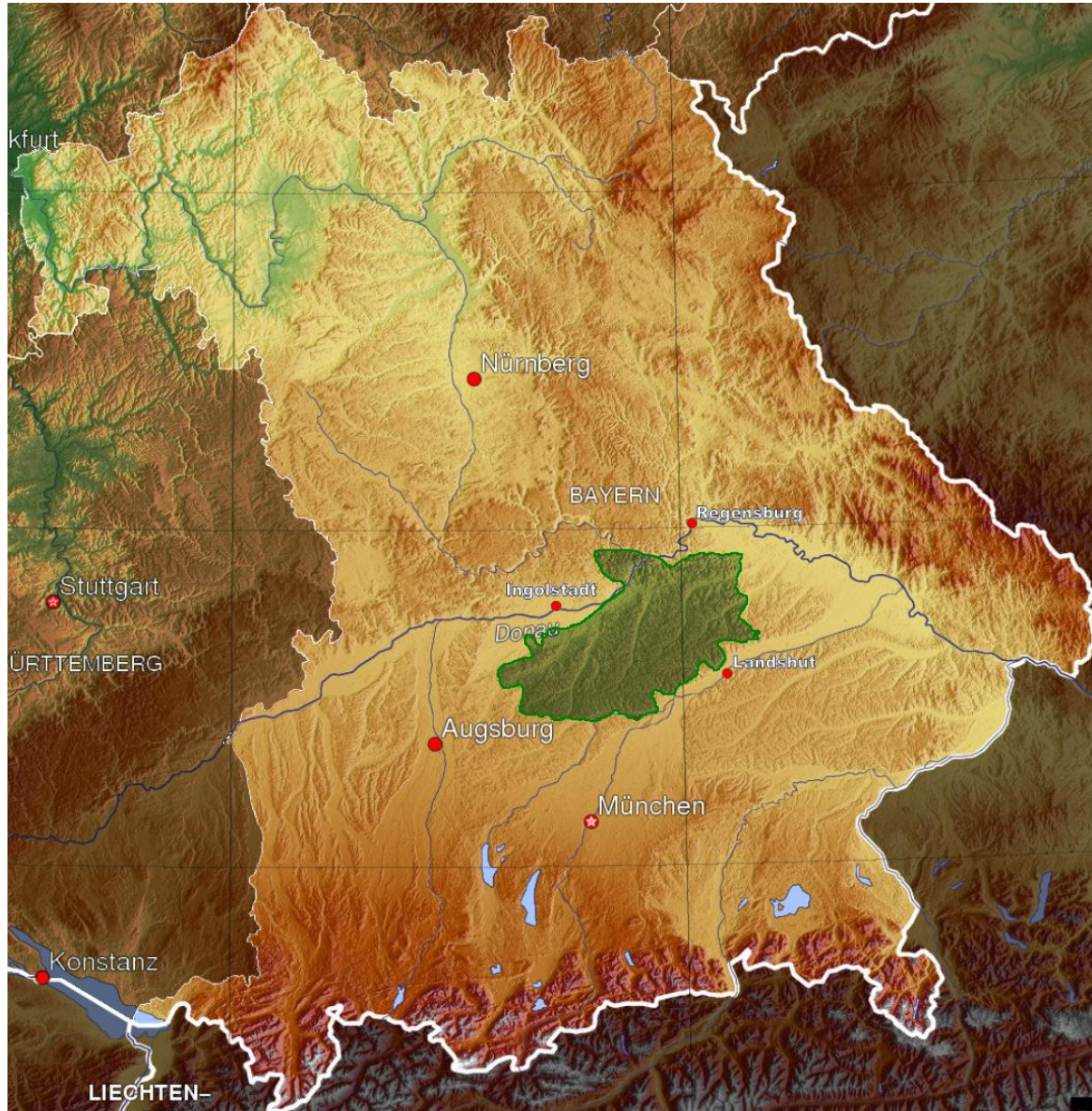
‘From dirt to kettle’

Patrick Daniels



The Hallertau Region

- Located along the 48th parallel about 45 miles north of Munich in Bavaria.
- Largest contiguous hop growing region in the world at 65 sq. mi.
 - Yakima Valley – 38 sq. mi.
 - Cleveland – 80 sq. mi.
- About 90% of German hops are grown in the Hallertau.
- (80% of German hops are exported)
- The Hallertau region is ideal for hop growing with well draining, soft and slightly acidic soil. An average of 15 hours of sunlight in the summers. Frost free from April to September.



Hallertau Hop History

- First mention of Hallertau hop gardens found in a 768 AD document from the Abbey of Weihenstephan
- Cultivation of hops began in the 16th century after the Reinheitsgebot is issued in Ingolstadt in 1516
- Monastic and royal breweries committed to hop cultivation and with their high concentrations in Bavaria, the regions hop gardens flourished.
- Hop Research Institute in Hüll begins its breeding program in 1926.
- The German Hop Provenance Law of 1929 stipulates where hops can be grown and issues seals for hop growing districts to assure quality and protect against misuse in the EU.



The Euringer Hop Farm

- Located in the village of Dünzing along the Danube river with a population of about 300 and 4 other hop growers.
- Began hop growing operation in 1952.
- Farm is now run by Franz and Rita Euringer with their son and daughter, Simon and Mona to help during the harvest.
- Farm is ISO 9000 certified. A special ISO certificated for German hop growers was recently created and only 10% of growers hold this certification.
- 8 hop varieties are grown on 37 acres.
 - Hallertau Mittelfrüh at ~ 4.5 α -acids
 - Hallertau Tradition at ~ 5.6 α -acids
 - Hersbrucker Spät at ~ 3.2 α -acids
 - Spalter Select at ~ 5.2 α -acids
 - Saphir at ~ 4.0 α -acids
 - Perle at ~ 7.5 α -acids
 - Herkules at ~ 15.0 α -acids
 - Mandarina Bavaria at ~ 9.0 α -acids
- Hop harvest will begin the end of August and last about 3 weeks.



The Hop Yard

- A Hallertau hop yard will consist of a high trellis system. The top of the poles and cross wires will be 25' high.
- The poles will be made from local Pine or Fir trees and treated naturally. The cross wires are a strong galvanized aircraft cable.
- The site is selected away from populated or forested areas to provide maximum sunlight exposure.



The Hop Yard

- A very thin metal wire is tied to the top cross wire and anchored into rows below.
- In spring the hops are trained to climb this wire, and they will climb the entire height during the summer months.
- Between the rows are the narrow 'alleyways', about 8' wide and cover crops are grown here to benefit the soil and control pests.



A quick look at a U.S. design..

- In the U.S. the height of the trellis system is generally lower, at about 18'.
- The plants are spaced farther apart from each other
- The alleyways are wider.
- The farms and hop yards are much larger
- and of course, the hops are different varieties... Sometimes.



So, How do we begin harvesting hops?

Step 1: Learn how to use stilts. Stilts are the only way to cut the top of the hop plant from a cross wire.

wait, it's the year 2013 and I am in a modern Germany...



I'm using a hop picking tractor.



- At sunrise on the first day of the harvest; we start out with the tractor and wagon to begin cutting 2 acres of Hallertau Mittelfrüh.

Down come the hop bines.

- Starting at the outside edge of the hop yard, the tractor will align with a row of hop plants.
- The cutting arm will be positioned about 2 feet above the row.
- As the tractor moves slowly down the alleyway; the cutting arm will grab a hold of the base of each plant.
- As the tractor advances; the plant, held by the picking arm, snaps off of the top cross wire and falls into the collecting wagon.



Time to head back home with a full wagon



The Harvesting Machine

- The harvesting machine is the work horse of the hop harvest.
- It is tasked with gently separating the hop cones from the main plant.
- It will stay turned on 15 hours a day and harvest 3 plants a minute.



The Harvesting Machine

- The tractor and wagon will show up every hour with a full load of hop plants

- At the entrance to the machine, a circulating double chain with hooks catches the root-end of the plant and carries the plant into the harvesting machine.



Inside the Harvesting Machine

- The hop bine is slowly pulled through a series of drum rollers, with spring loaded 'fingers' to brush the cones off rather than brutally rip them off.
- A shattered, beat up cone, will not kiln uniformly.



Outside the Harvesting Machine

- The free hop cones fall out of a series of collecting trays along the lower part of the machine and a series of conveyor belts begin to separate them from leaves and other foreign matter.



The Kiln

- The series of conveyor belts end at the highest point of the hop farm, the kiln.
- The kilning room is square shaped, but from the outside looks like a tower. A furnace is located at the base of this tower and a perforated floor allows the warm air to travel upwards; drying the cones.
- Commercial kilning designs can differ but the drying objectives are the same:
 - **Dry the hops evenly with temperatures between 120F and 140F.**
 - **Reduce the moisture of the cones evenly, starting with about 80% moisture and ending with about 8-10.**



Out of the Kiln

- After about 90 minutes of drying, the perforated louvered floor, opens up and the hops fall into a collecting drawer below.
- The kilning room is very humid and smells more like a summer bag of lawn clippings than hops.



Into The Conditioning Chamber

- The dried hops must be evenly cooled and dried before packaging.
- The hops will rest overnight in the low moisture conditioning chamber held at about 70F.



Into Bales.

- Baling is the first form of packaging for the hops. Although many brewers will never see their hops this way.
- The hops are top loaded through a hydraulic press and compressed to about 130lb. A bit over 1 Zentner (50kg).
- The compression of fluffy hops into dense bales reduces the oxygen contact with all but the top layer of the bale, slowing the oxidation of oils and alpha acids



If I were helping out 70 years ago...



Handarbeit, um 1920
Foto: Archiv der Textilindustrie

But, this is my workstation today for baling hops

- Outfitted with the old faithful 'Aqua – Boy' moisture analyzer, Made in West – Germany.
- A more modern moisture probe to stab into bales for a reading.
- A ledger to record the bale weight and ID and

Most Important of All:



The German Hops Seal

- This seal (now very modern looking) certifies the leaf hops by identifying:

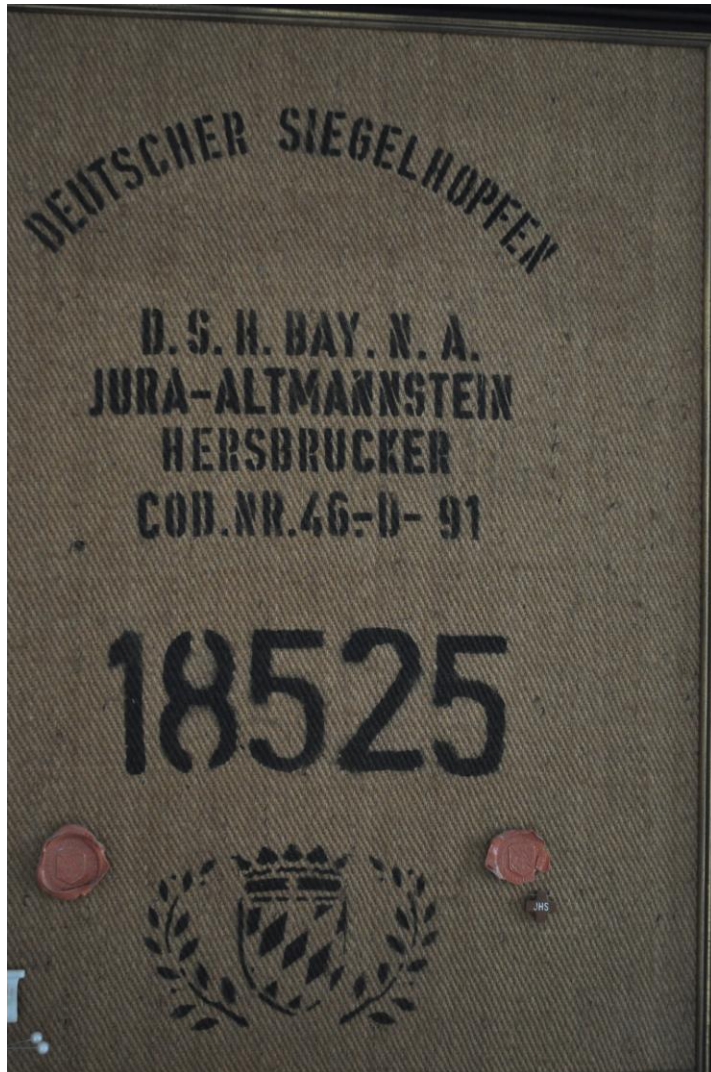
- Country of origin
- Production region
- Crop year
- Variety
- Treated or not.

(bleached w/ SO₂)

- When you apply this seal incorrectly, you will know...



Older examples of hop seals



The Lagering Hall (not just for beer)

- After the hops are baled and weighed, they are stacked onto pallets to fulfill the contracts from the hop brokers (HVG, S.S. Steiner, Barth-Haas, etc.)
- Inspectors come almost daily to inspect the lots and take samples for quality control



Quality Control

- The Hopfenring (a state designated hop inspection board) manually examine the incoming samples, recording;
 - Moisture content.
 - Proportion of leaves and stems. (Sieve tower)
 - Uniform color and smell.
 - Attacks from pests or diseases.
 - Varietal purity, foreign bodies, seed parts.



State Quality Control

- After manual examination, the hops are sent out for more intensive lab analyses.
- These Include:
 - Alpha samples
 - Oil compositions
 - Pesticide residue
 - Plant composition
- After all the testing and QC the growers and brokers are presented with the information separately and the laboratory stores the hops and their findings for any information need in the future.



- Only when the hops have meet the requirements of the certification office, can they enter the hop market and become available for

New German Hops

- In 2012 four new German hops were presented to the American Craft Brewers Conference in San Diego.
- The new hops, now known as the 'Hüll Special Flavor Hops' are Germany's competitive answer to intensive hops to come out of the US and Australia/New Zealand.
- The new hops were bred with female American Cascades and a German Hüll male line. This was to blend citrusy American aromas with classic nuances, also to increase disease resistance.
- The new hop rhizomes have been released to farmers to begin large scale growing trials.



Hallertau Blanc

- **Hop** has floral – fruity aroma, with hints of passion fruit, grapefruit, gooseberry and pineapple.

Alpha Acids: 9.0 – 11.0%

Total oils: 1.5ml/100g

- All brewing trials are done with single – hopped beers including top and bottom fermenting types using conventional late hopping regime and/or dry –

hopping **Brewing Trials with Hallertau Blanc**

- Reveal the aroma of green fruits and mango
- Perceivable gooseberry aroma
- With the similar bouquet of refreshing white wine



Huell Melon

- **Hop** has fruity and sweet aroma, showing honeydew, melon, apricot and strawberry notes.

Alpha Acids: 7.0 – 8.0%

Total Oil: 0.8 ml/100g

Brewing Trials with Huell Melon

- A clearly perceivable sweet, honeydew melon aroma
- A clean bitterness
- Slight floral and apricot notes



Mandarina Bavaria

- **Hop** has a very distinctive aroma of tangerines and citrus with pleasant fruity notes.

Alpha Acids 7.0 – 10.0%
Total Oil 2.2ml/100g

Brewing Trials with Madarina Bavaria

- A pronounced mandarin – orange aroma
- Strong citrusy flavor
- Excellent drinkability



Polaris

- **Hop** has newly distinctive and refreshing aromas described as 'glacier mint and eucalyptus' coupled with intense fruity aroma.

Alpha Acids 19 – 23%

Total Oil 4.5ml/100g

(both extremely high)

- Millennium 2.2 ml/100g
- Apollo 2.8 ml/100g
- CTZ 3.5ml/100g

Brewing Trials with Polaris

- Uniquely distinct aromas of mint, eucalyptus
- Excellent aroma and bitter qualities
- Spicy, citrusy notes



Keeping it local

- Dedicated to the Bavarian tradition of weissbier and using Hallertau hops, Schneider Weisse is the perfect brewery to spend a day with.
- Although lightly used in weissbier brewing, hops are still hand selected by Schneider.



Time to bring it all together...



- A bicycle ride to a beer garden, the Blue Danube and weissbier to end the day.

Prost aus der Hallertau!

