



25th year of the conference “Application of Czech hop varieties in brewing”

Žatec, 30 March 2023 – Bohemia Hop, a.s. and Hop Research Institute Co., Ltd.





Foreword

The 25th anniversary conference "Application of Czech hop varieties in brewing" took place on the penultimate day of March 2023. This event is organised annually by Bohemia Hop, a.s. in cooperation with Hop Research Institute Co., Ltd. (Chmelařský institut, s.r.o.- CHI).

Although the date of the event followed only a few days after the Spring Brewmasters' Award in Zvíkov, the total number of registered experts across the brewing industry was at the capacity limit of the CHI conference hall. The main programme, which consisted of a panel of lectures and accompanying tastings, was attended by nearly 120 experts. Most of those present took the opportunity to visit the newly installed microbrewery in the premises of the original Žatec brewery and to visit the brewery museum. More than 80 participants stayed for the final "after party", which took place in the Temple of Hops and Beer restaurant.

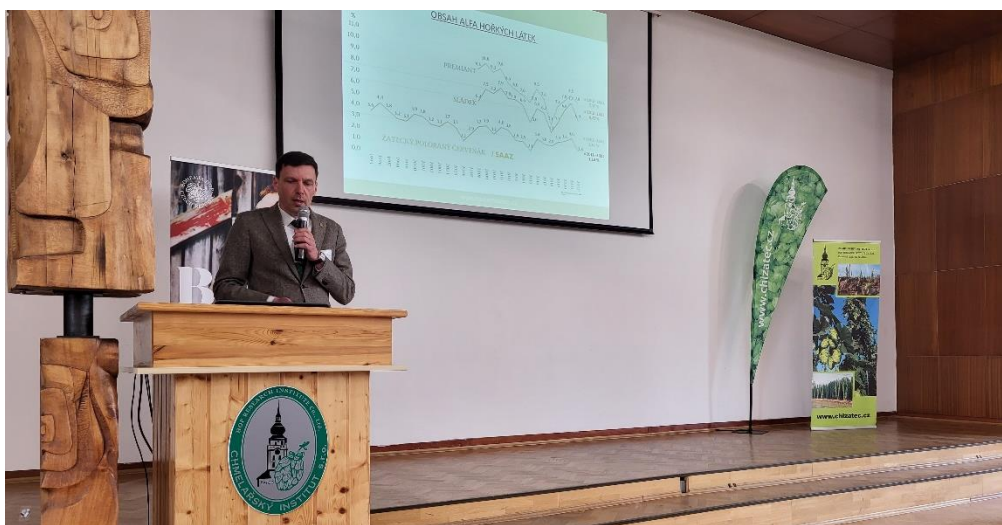
The author of the recipes for the accompanying tasting was Jan Hervert, who also brewed all the beers in the Experimental Brewery of the Hop Research Institute Co. Ltd.





Panel of lectures and tastings

The opening speech was traditionally taken by Zdeněk Rosa, who welcomed all participants and introduced them to the current situation in the field of hop growing in the Czech Republic.



Saaz Late, Country and Sládek varieties at the beginning of the lager hop brewery

The opening speech was followed by the first round of tastings in which the Saaz Late, Country and Sládek varieties were used in the hopping stages of the Czech style lager to achieve the desired bitterness. All the beers were hopped with a fine aroma Saaz variety in the last stage (15 min. before the end of the wort boiling).

Series:	Lager: Sládek, Country, Saaz Late	
Batch of wort:	60 l (50 l young beer)	
Malt:	Pilsner, Munich	
Mashing:	Single-mash decoction (90 min.)	
Hops:	Saaz (4.03%)	T _{80min} 67.6 g + whirlpool 34.5 g (same for all the samples)
	Country (2.78%)	T _{05min} 98.3 g, T _{40min} 98.3 g
	Sládek (7.0%)	T _{05min} 38.8 g, T _{40min} 38.8 g
	Saaz Late (2.76%)	T _{05min} 98.6 g, T _{40min} 98.6 g



Sample	Plato	IBU	Points	Placings
Saaz Late	12.0	41.6	3.26	3
Country	12.2	38.8	3.88	2
Sládek	12.0	42.8	3.92	1

All tasted samples were of excellent quality with very good drinkability and achieved high marks. The best-rated beer was a beer where the Sládek variety was used for bitterness. An almost identical result was achieved by a beer where the Country variety was used in the same hopping stages. This variety, which is grown on low hop trellises, has shown very good potential in the production of traditional Czech lager.

Export support and presentation of the book "Beer production in practice" by Tomáš Kinčl

The first lecture was given by Karolína Bartošová from the Ministry of Agriculture, who presented marketing tools to support the export of Czech raw materials, food and beverages, which are jointly under the responsibility of the Ministry of Foreign Affairs. She showed examples of missions that have already taken place and informed the audience on how they can get financial and administrative support if they want to expand abroad.

The second part of the lecture was given by Tomáš Kinčl from the University of Chemistry and Technology Prague, who presented his experience from these foreign missions. He pointed out the uniqueness and exceptional position of Czech lager abroad and presented his book "The Practice of Beer Production" (Praxe výroby piva), which he published in 2022 and which received very good reviews.

In 2022, for example, representatives of the Consulate General and representatives of the largest brewery school in Brazil "Instituto da Cerveja" in Sao Paulo organised a lecture and course focused on the production of Czech lager, where the main and most discussed topic was the decoction method of mashing and the use of Czech raw materials. In addition, there was a collaborative brewing of beer in cooperation with the TARANTINO brewery. The inspiration was a Czech semi-dark (amber) lager, for the production of which Pilsner and Munich malts were used. The technology enabled a single-mash decoction. Only Czech hop varieties Agnus and Saaz, supplied by BOHEMIA HOP, a.s., were added during wort boiling. In the same year, Tomáš Kinčl brewed a collaborative batch of pale lager at the Koala San Brew brewery, located in the Brazilian state of Minas Gerais.





Saaz Shine triangular test

In the second series of tastings, a triangular test was carried out. The samples were supplied by one of the Czech industrial breweries. For comparison, it used a sample of its standard recipe beer, the second sample was a beer where the Saaz Shine variety was used for the final hopping.

Determining the correct pair of beers		Preferred placings	
Yes 26	No 78	Saaz Shine 15	Control 11

The triangular test proved inconclusive. Only 25% of the evaluators marked the correct pair of beers. The beer samples were very similar. The Saaz Shine variety, which responds very well to temperature fluctuations during the growing season and has a very stable annual yield and alpha bitter content, proved to be a suitable alternative to the traditional Czech fine aroma variety Saaz used in the control sample.

Breeding process in practice

The third lecture, given by Vladimír Nesvadba from CHI described the complete breeding process of breeding new hop varieties and their implementation in breweries. He pointed out why it can sometimes take more than two decades to breed a new variety. Out of several thousand breeding materials, only units of promising genotypes that have the potential to be registered as a new variety will make it to the final experimental cultivation, sensory evaluation of hop cones and brewing trials.





Czech Premiant, Sládek and Kazbek aroma varieties for dry hopping Cold IPA

The third series of tastings focused on the new Cold IPA style, which is gaining more and more popularity. It is a style that can be considered as a crossover between the IPL and IPA styles. Although varieties from the group of "flavour" hops represented by the Czech variety Kazbek are primarily used for the dry hopping of this style, in this series the traditional Czech aroma varieties Premiant and Sládek, which are mainly used in the production of traditional Czech lager, were also used. At the beginning of the wort boiling, use was made of the bitter variety Vital. The tested varieties were added for the second and final hopping during the boil, followed by dry hopping in the fermentation tanks.

Series:	Cold IPA		
Batch of wort:	60 l (50 l young beer)		
Malt:	Pilsner, oat flakes		
Mashing:	multi-stage infusion (90 min.)		
Hops:	Vital (11.05%),	T _{05min} 28.8 g (same for all the samples)	
	Sládek PE45 (9.64 %)	T _{80min} 50.7 g + whirlpool 101.4 g, SCH (KT) - 3 days 3.5 g/l + 5 days 3.5 g/l	
	Kazbek (5.27%)	T _{80min} 93.1 g + whirlpool 186.4 g, SCH (KT) - 3 days 3.5 g/l + 5 days 3.5 g/l	
	Premiant PE 45 (9.66%)	T _{80min} 50.8 g + whirlpool 101.6 g, SCH (KT) - 3 days 3.5 g/l + 5 days 3.5 g/l	

Sample	Plato	IBU	Points	Placings
Sládek	14.4	46.8	3.74	3
Kazbek	14.4	49.2	3.79	2
Premiant	14.5	44.4	3.81	1

This series was the most balanced in terms of popularity, although the sensory profile of the individual beer samples was different. Thus, most evaluators correctly identified the varieties used in the blanks. The high scores show that all samples were very tasty and drinkable. The Premiant and Sládek varieties were selected on the basis of their sensory profiles and total essential oil content. It has been shown that biotransformation processes during dry hopping in fermentation tanks (2 successive batches of dry hopping towards the end of fermentation) give the beer a fruity and floral aroma character. This test also showed that besides the Kazbek variety, the Premiant and Sládek varieties have a very good potential for Cold IPA style hopping.



Development of dry hopped beers and new trends of Brut IPA and Cold IPA

Another lecture was given by Pavel Palouš from the Cobolis brewery. In his presentation he described the gradual development of dry hopping, the influence of biotransformation processes and added his practical experience with dry hopping with pellets, dried cones and fresh "green" hops. At the end of his presentation, he introduced the audience to the Cold IPA and Brut IPA styles, which were offered as an accompanying tasting.



Sensory evaluation of new Juno, Pluto, Saturn varieties in ALE style. Single-hop, three times hopped versus blended

The fourth series of tastings focused on a comparison of the newly registered Juno, Pluto and Saturn hop varieties in ALE style dry hopping. The three beer samples were hopped with 100% of one variety, the so-called single-hop. In the next sample all three varieties were used together in the dry hopping. In the last sample, all three "single-hop" beers were mixed ("blended"). This experiment was designed to show how the resulting sensory profile of the beers is influenced by the varietal composition of the hops. The same weights of hop batches were used for all dry hopping.

Series:	ALE	
Batch of wort:	60 l (50 l young beer)	
Malt:	Pilsner, Pale Ale, wheat, oat flakes	
Yeasts:	Lallemand Verdant IPA	
Mashing:	single infusion (90 min.)	
Hops:	Juno (5.5%),	T_{05min} 50.0 g, T_{78min} 78.0 g + whirlpool 90 g, SCH (KT) 1 day 2 g/l + 5 days 4 g/l
	Pluto (8.45%)	T_{05min} 32.5 g, T_{78min} 45.5 g + whirlpool 58.5 g, SCH (KT) 1 day 2 g/l + 5 days 4 g/l
	Saturn (7.30%)	T_{80min} 37.6 g, T_{78min} 52.7 g + whirlpool 67.8 g, SCH (KT) 1 day 2 g/l + 5 days 4 g/l

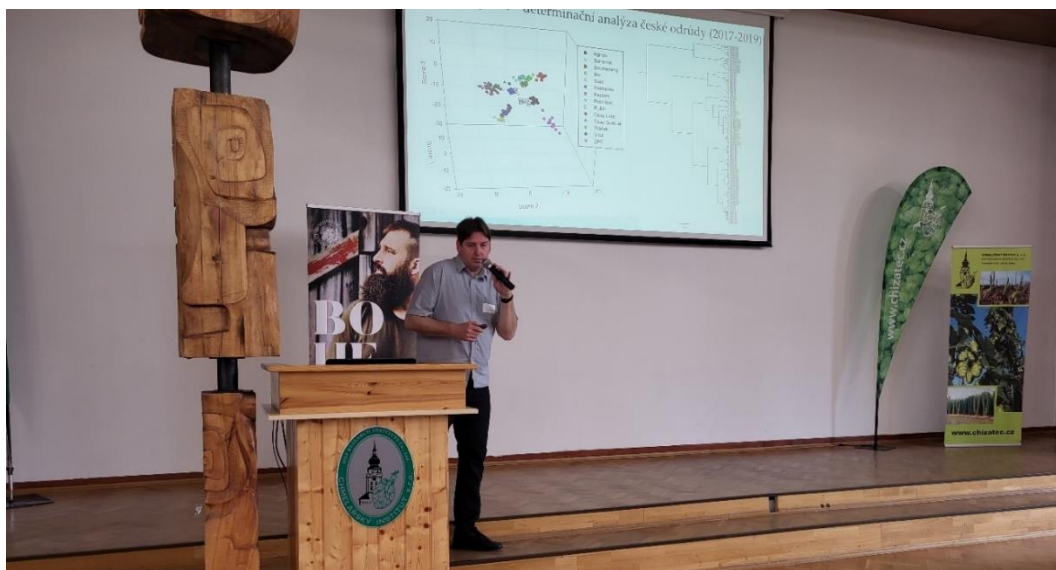


Sample	Plato	IBU	Points	Placings
Blended		37.4	2.95	5
Juno	12.6	35.1	2.99	4
Pluto	12.9	36.6	3.28	2
Saturn	12.8	41.3	3.31	1
3x hopped	12.9	34.9	3.13	3

The best rated and most aromatically distinctive sample was the one hopped solely with the Saturn variety. This variety has the highest essential oil content (1.5-2.5 g/100 g) compared to the others. An almost identical result was achieved by the Pluto variety, which has a slightly lower essential oil content (1.0-2.0 g/100 g). The beer brewed from the Juno variety with the lowest essential oil content (0.9-1.5 g/100 g) had a pleasant but less pronounced aroma. This beer was preferred by the evaluators who favour traditional lager styles in the internal tasting. In the comparison of the "blended" beer with the 3x hopped beer, there was a higher preference on the side where the 3 varieties were used together in the wort boiling and for dry hopping.

Determination of sensory hop profiles

Josef Patzak from the Hop Research Institute explained in his lecture how the sensory profiles of hop varieties are determined. He described the individual fractions of hop essential oils and how the individual essential oils affect the resulting hop aroma. In one example he demonstrated how hop essential oils show up in the aroma profile of beer.





Dry hopping from the technology point of view. External continuous HopFeeder CzB.

Jiří Karlík from Czech Brewmasters focused on dry hopping from the technological point of view in the final lecture. He familiarised the attendees with the different methods of dry hopping, from dosing hops directly into the beer, to the methods of inserting woven curtains, stockings and feeding dosers on the tank, to external continuous feeders, which are commonly known as "hopgun". He mentioned the advantages and disadvantages of individual dosing methods and introduced the HopFeeder CzB continuous doser of Czech origin.



During this lecture, a tasting of NE IPA style beer was offered, where Ceres and Venus varieties bred at the Hop Research Institute were used for whirlpool and dry hopping in the fermentation tank.

Series: NEIPA (15,3 Plato, 36 IBU)
Batch of wort: 60 l (50 l young beer)
Malt: Pilsner, Pale Ale, wheat, oat flakes, wheat flakes
Yeasts: Lallemand Verdant IPA
Mashing: single infusion (90 min.)
Hops: Ceres (7.6%), whirlpool 125 g,
Venus (8.25%) whirlpool 125 g,
Ceres/Venus SCH (KT) 2 days 5.5 g/l (50/50) + 4 days 5.5 g/l (60/40)



Side tastings

Introducing Saaz Shine, Saaz Comfort and Saaz Brilliant in lager

The tasting and evaluation of lagers using the Saaz Shine and Saaz Comfort varieties took place in the foyer throughout the day. In the first sample (12.1 Plato; 39.2 IBU), the Saaz Comfort variety was used for the 1st and 2nd hopping of the wort boiling process, and the Saaz Shine variety was used in the final hopping and whirlpool stage. In the second sample (12.0 Plato; 38.6 IBU), the varieties were swapped (1st and 2nd hopping Saaz Shine, 3rd hopping + whirlpool Saaz Comfort). There was also a sample made from Saaz Brilliant on tap.

Series:	Comfort/Shine	
Batch of wort:	60 l (50 l young beer)	
Malt:	Pilsner, Munich	
Mashing:	single decoction (90 min.)	
Hops:	Saaz Comfort (4.73%),	T _{05min} 57.7 g, T _{40min} 57.7 g
	Saaz Shine (3.52%)	T _{80min} 77.3 g + whirlpool 77.3 g

Series:	Shine/Comfort	
Batch of wort:	60 l (50 l young beer)	
Malt:	Pilsner, Munich	
Mashing:	single decoction (90 min.)	
Hops:	Saaz Shine (3.52%)	T _{05min} 77.3 g T _{40min} 77.3 g
	Saaz Comfort (4.73%),	T _{80min} 57.7 g + whirlpool 57.7 g

Series:	Brilliant	
Batch of wort:	60 l (50 l young beer)	
Malt:	Pilsner, Munich	
Mashing:	single decoction (90 min.)	
Hops:	Saaz Brilliant (3.75%), T _{05min} 72.2 g, T _{40min} 72.2 g, T _{80min} 72.2 g + whirlpool 36.7 g	

In this respect the results were unambiguous. Sample 1, where Saaz Shine was used for the 3rd hopping + whirlpool was preferred by 23 of 26 evaluators. A similar result was achieved at Zvíkov during the Spring Brewmasters' Award, where 25 of the 27 tasters preferred this sample.



Vital variety in commercially produced beers

In the accompanying tastings it was also possible to taste beers where the Vital variety was used during hop brewing. The beers on tap were supplied by Pivovar Radouš (Pilsner Illgner, 12.0 Plato, 38 IBU, 4.8% alc.), Pivovar Ferdinand (Světlý Max, 11 Plato, 42 IBU, 4.7% alc.), Dudák – Měšťanský pivovar Strakonice (test brew, 11.0 Plato, 40 IBU, 4.4% alc.) and Pivovar Popelín (Popelínský Jantar, 12.0 Plato, 4.9% alc., IBU not measured).





Afternoon programme and after party at the "Temple"

The afternoon programme included a visit to the brewery museum and the new Sedmý schod brewery with a capacity of 2,500 hectolitres, which is located on the premises of the original but now closed Žatec brewery. Visitors were guided through the brewery by managing director Martin Kec, who also gave access to the brewhouse of the old brewery and the water tower. At the end of the day Bohemia Hop invited all participants to sit in the Temple of Hops and Beer restaurant, where beers from the local U Orloje brewery and the Sedmý schod were served. Most of those who stayed participated in the evening general quiz hosted by Zdeněk Rosa.



See you next year in Žatec...

Past reports on www.bohemiahop.cz