

## VARIATIONS IN HOP AROMA DEPENDING ON CROP YEAR

### | TECHNICAL SUPPORT |

As usual in December, we are pleased to share some data of the hops' compositions which is important to achieve consistent hop aroma in beer, especially when changing from one crop year to another.

Based on the addition of the same quantity of bitter substances towards the end of boil, the resulting late hop flavour might vary. Therefore, the ratio of linalool to alpha acids is recommended to assess the aroma intensity (see also previous December newsletters).

	Linalool [ppm] / Alpha acids [%]		
	2019	2020	+/-
US Cascade	8.4	6.6	- 1.8
US Lemondrop	8.5	7.2	- 1.3
US Mount Hood	7.1	10.7	+ 3.6
US Willamette	13.5	13.2	- 0.3
DE Hallertauer Tradition	5.4	11.5	+ 6.1
DE Hersbrucker	18.3	10.8	- 7.5
DE Perle	2.4	2.6	+ 0.2
DE Saphir	19.9	26.0	+ 6.1

Fig.1: Ratio of linalool / alpha acids acc. to Analytica EBC 7.12 / 7.7

For the shown varieties often used in late hopping (Fig. 1), fluctuations of the hop aroma intensity are unlikely for Lemondrop, Cascade, Willamette and Perle. Attention should be given if late hopping is done using Mount Hood, Hersbrucker, Hallertauer Tradition or Saphir. For the positive values a higher aroma intensity can be expected if hop dosage remains the same, in case of negative values (like Hersbrucker) more hops should be used to match the current sensory profile.

In addition to the previous years, we have also listed some hop varieties that are often used for dry hopping. This hop addition is often based on the total amount of hop oils and not on single components.

	Amount of hop oil [ml/100g]		
	2019	2020	+/-
US Bravo	3.0	2.8	- 0.2
US Cascade	1.3	1.5	+ 0.2
US Centennial	3.4	2.8	- 0.6
US Eureka!	3.2	3.6	+ 0.4
US Lotus	0.7	0.8	+ 0.1
US Sultana	3.3	3.2	- 0.1
DE Hallertau Blanc	1.1	1.0	- 0.1
DE Mandarina Bavaria	1.1	1.5	+ 0.4
DE Polaris	3.3	3.1	- 0.2

Fig.2: Amount of hop oil content acc. to Analytica EBC 7.10

If you are keen to learn more about the current data of your hop varieties, please do not hesitate to contact us! (info@hopsteiner.de)

Hoppy X-mas

*Simon H. Steiner, Hopfen, GmbH*     *S. S. Steiner, Inc.*

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## CONGRATULATIONS!

**Sandro Cocuzza honored with the sixth Ludwig Narziß Prize**



This year's winners are very deserving of their award. From the 33 submitted and the 27 published contributions in the BrewingScience in 2019, the one singled out to receive the award was entitled: "The impact of dry hopping on selected physical and chemical attributes of beer", authored by Sandro Cocuzza of Simon H. Steiner Hopfen in Mainburg, Germany, and his colleagues and co-authors Alexander Stallforth and Frank Peifer as well as Dr. Martin Zarnkow and Prof. Fritz Jacob of the Weihenstephan Research Center for Brewing and Food Quality.

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