

HOPSTEINER – NEWSLETTER

February 2009

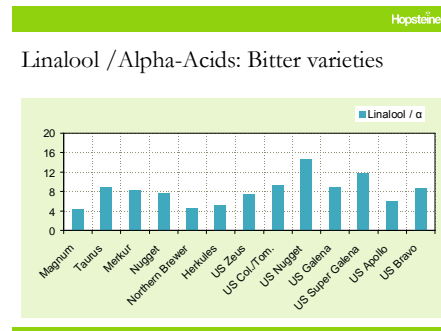
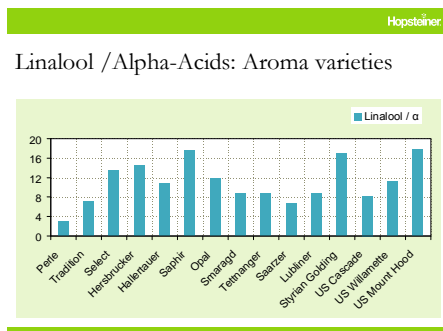
- Technical Support -



Variations in Hop Aroma Depending on Variety and Crop Year

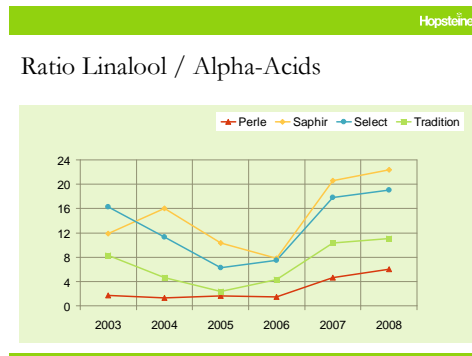
Variations in the alpha content of hops due to weather conditions are well known. However - it is not normally thought that hop oil content can also vary significantly.

As the concentration of the terpene alcohol **linalool** shows a very good correlation to a hoppy aroma in beer, this substance can be used as a representative indicator of this variability. Hops are usually dosed according to their concentration of alpha acids. However, in the following diagrams, we can clearly show the variation of linalool relative to alpha acids. The ratio is calculated by dividing linalool in ppm by alpha acids in % according to EBC 7.7.



From these figures it can clearly be seen that producing beers with the same bitterness, using different varieties, can result in strongly varying linalool concentrations and therefore hoppy aroma.

It is also a fact that there are strong fluctuations from crop to crop, which is shown in the figure below for the years 2003 through to 2008.



The variety Perle is shown to be fairly stable between crops 2003 and 2006. However, as this variety is not normally strong in aroma, it is not usually used as a late addition aroma hop. The other varieties shown vary considerably from crop to crop. The ratio linalool / alpha of Saphir, for example, was extremely low in crop 2006 and three times higher in 2007. By leaving the aroma addition in the brew house unchanged, this could result in a much higher concentration of linalool in the final beer when using 2007 hops compared to 2006 material. This situation is typical for all other aroma varieties used for achieving a pleasant hop aroma in beer.

As a final conclusion therefore, we recommend that brewers also consider the aroma compounds, when calculating the dosage of aroma hops for late hopping. In case of questions, our experts will be happy to assist you!