



# **HUMULUS LUPULUS**

## **AND OTHER BITTER TRUTHS**

### **The best DDH**

The latest version of the craft beer ABC goes like this: NZDDHDIPA – it's a variation on DDHDIPA, which is descended from DDHIPA, a variant of NEIPA. Got that? NZDDHDIPA stands for New Zealand Double Dry-Hopped Double India Pale Ale, a beer that was recently launched by the Norwegian brewery Lervig. The nine letters promise a bumper pack of alcohol and hops of the most sought-after kind. What we have here is a Double IPA (DIPA) that has been treated to Double Dry-Hopping (DDH) with New Zealand (NZ) hop varieties that are both rare and full of character.

We've been familiar with DIPA, the stronger variant of IPA with an alcohol content of 7.6 percent by volume, for quite some time now. Its origins go back to 1994. It was the inaugural beer of a San Diego brewpub that established this style. However, it's only recently that the letters DDH began to circulate in the beer world. They spilled over into the increasingly cryptic beer descriptions with the wave of NEIPAs, New England IPAs (also known as Juicy & Hazy).

DDH promises consumers an explosion of hop aroma. However, exactly what DDH means in technical terms has not been defined by the brewing community: A double dose or two doses of dry hopping? A larger quantity or two process steps?

According to the hop flavor experts at BarthHaas, there is only one answer: "Everything points to multiple dry-hopping," says Head of the Brewing Solutions Team, Dr. Christina Schönberger.

In principle, dry hopping can take place at any time after the wort has cooled: During the main fermentation, during maturation, during storage, and in the finished beer. In the process, the aroma compounds are meant to dissolve and be dispersed. However, many of the hop aroma compounds are hardly or only slightly soluble. Brewers can make use of the following parameters to positively influence solution behavior:

- Alcohol concentration
- Exchange surface and movement
- Yeast activity/temperature

From a practical perspective, it makes sense to spread dry hopping over the maturation and storage phases. During maturation, the alcohol content and the slightly higher temperature both help. Gentle circulation is ensured by means of secondary fermentation.

During storage, the alcohol content helps again and, as no more yeast or trub residue is present to absorb the aroma compounds, no flavor is lost. However, the beer is no longer moving.

From a sensory perspective, it makes sense to extend dry hopping to include the main fermentation. Here the yeast activity ensures natural circulation and the creation of additional pleasant, fruity aromas. In addition, the higher temperature contributes to the dissolution and distribution of the compounds. Yeast activity and temperature also influence which aroma compounds are expelled with the CO<sub>2</sub>. However, the yeast cannot then be reused.

Thus, each point of dry hopping will lend a different hop aroma to the beer, and more dry hopping will consequently result in greater complexity. Research has even shown that multiple dry hopping can lead to a more intense aroma using a lower (!) quantity of hops. As the dissolving behavior of the hop aroma compounds is suboptimal, adding astronomical quantities just doesn't help. It only increases beer loss.

The motto is: Smart hop addition instead of larger quantities! – And the best DDH is TDH (triple dry hopping).

**Participants in the online course "Hop Flavor Impact Day", which takes place on October 27, will find out more about the origin and creation of hop aroma in beer. Registration & information: [BarthHaas.de](https://www.barthhaas.de).**