A Closer Look at Hops

In some ways, the American craft beer world has spent the last decade or four building its reputation around one ingredient: hops. The ever-hoppy American pale ale and IPA styles have defined modern American beer to many by offering a diverse range of hoppy flavors that keep every pint interesting in an age of flagrant and celebrated brand disloyalty. It's easy to dismiss the world of hoppy beers as nothing more than an IBU arms race, but there's so much more to hops than that. Let's have a little looksee:

What are hops, really?
The word "hops" refers to the cone-shaped flowers produced by female plants of the species *Humulus lupulus.* Harvested in the fall, these flowers are quickly dried for use in brewing throughout the year. They are grown commercially around the world in dozens of varieties. Each variety has it's own distinctive character that it can impart to beer.

Why use hops?
On the surface, hops seem like a strange ingredient choice. Why the heck would we boil flowers in our beer? And why is it an almost universal practice amongst brewers around the world? Well, in a lot of ways, hops seem to be designed specifically for use in beer.

Upon harvesting, hops are absolutely packed with two important substances: alpha acids and hop oils. In the brewing process, alpha acids are heated in liquid and transformed into iso-alpha acids, which are mainly responsible for providing bitterness to beer. Even if you don't dig ultra-hoppy beer styles, this is important. Without some supporting bitterness, many beers would taste overly malty, sweet, or otherwise out of balance. When you hear folks talking about IBUs (International Bitterness Units), they're talking about a measure of the beer's iso-alpha acid content.

But iso-alpha acids are more than just bitterness. They also help stabilize your beer's foamy head and have an antibacterial effect that limits the growth of bacteria that might spoil your beverage.

So hops offer a lot to the brewer. But to the drinker, hops are primarily beloved for the fruity, floral, earthy, and herbal aromatics they leave in beer. These aromatics are the work of the essential oils present in the hop cones. Each hop variety showcases a different balance of about 300 different oils, resulting in a wide range of hoppy aromatics that can be found in beer.

How are hops used?
To get all this good stuff out of hops, brewers add them to beer in two main ways. The first is by adding the hops to hot wort (pre-fermented beer) during the brewing process. This is most commonly done while the wort is being boiled—this is when alpha acids make that transformation into the bitter, antibacterial iso-alpha acids brewers need. But boiling hops drives off much of the aromatic oils drinkers love. As such, brewers often add hops at multiple points during the boil. Earlier additions contribute a lot of iso-alpha acids, but lose a lot of hop oil; later additions retain a lot of the aromatic oils, but don't contribute a ton of iso-alpha acid.

For even more fragrant punch, brewers add hops at the end of fermentation, in a process called dry hopping. Because the hops aren't heated, they don't contribute any significant amount of iso-alpha acid (or bitterness, by extension), but they do release their delightful oily aroma.

Hop on, hopheads!