

STOP AND SMELL THE HOPS

BY KENDALL JONES



WHY BEER'S BITTER, AROMATIC BUILDING BLOCK IS HAVING A HEYDAY



If you love hoppy brews, you are living in the golden age. America is now home to more than 5,300 breweries, far more than any other time in history, and most of them produce at least two or three different India pale ales. It's fair to estimate that at any given moment more than 15,000 IPAs are out there somewhere waiting for you to quaff. Thanks to hardworking hop farmers, these beers are bred as much as they are brewed.

IPA has dominated the world of craft beer for several years now, outselling all other styles by a longshot. People speculate about the nature of IPA's popularity but it's simple: it's the hops. Even newbie beer enthusiasts understand that IPA is differentiated from other beer styles by its unapologetic hop-forward character.

To feed the creative whims of brewers looking to set their beer apart from the crowd, the nation's hop farmers have introduced dozens of new hop varieties over the past three decades, each of which offers its own unique character.

FREEDOM OF CHOICE

Down to brass tacks, hops are the flowers of the hop plant, *Humulus lupulus*, used to flavor and stabilize a beer. Today there are over 150 different varieties available to brewers, two or more of which are usually combined in a beer's recipe in varying quantities and in various ways, so there is an infinite number of possible flavor profiles. Hopheads use terms like citrusy, dank, floral, earthy, tropical and other colorful descriptors to articulate the flavors found in their favorite beers.

Brewers haven't always enjoyed such a vast catalog of hop choices. Following Prohibition, most of the hops grown in America were one single variety, Cluster, which is still around today. It's a workmanlike variety that is not without merit, but lacks the kind of flamboyant character today's hop junkies crave.



IT TYPICALLY TAKES AT LEAST 10 YEARS FOR A NEW HOP VARIETY TO FIND ITS WAY FROM CONCEPTION TO YOUR PINT GLASS.

Hop varieties are generally divided into two categories: bittering and aroma (see sidebar on pg. 46 for more details). Back in the day, the super-sized breweries — that’s all we had until the 1980s — had no use for bold aroma hops. They simply needed adequate bittering hops for the relatively bland lagers they produced. Because they primarily brewed German-style lagers, many breweries relied on traditional European hop varieties, commonly referred to as “noble hops.” While they remain relevant and important today, noble hops lack the intensity and range of flavor found in modern aroma hops.

So where did all these aroma hops come from? It all started in 1972 when the U.S. Department of Agriculture officially introduced

a new hop variety, Cascade, which showed higher resistance to downy mildew, a persistent disease caused by a fungus-like organism to which hops are susceptible. This new hop variety also had much more pronounced aromatic and flavor qualities. Cascade is considered the first modern aroma hop and it is still widely used today.

The birth of craft beer in the 1980s, and its proliferation in the 1990s and 2000s, created a need for more, and more interesting, varieties of hops. Like the craft beer industry, the hop growing industry is booming and each year sees more acreage dedicated to producing this key ingredient.

FROM CONCEPTION TO CONSUMPTION

Barring Immaculate Conception, which does happen on rare occasion, new hop varieties are not begotten; they are made. New varieties are not simply discovered and they are not the result of unexpected cross-pollination. Hop farmers only plant females because harvesting the flowers — the precious hop cones — is the whole point. Male hop plants are carefully sequestered and used for breeding purposes only. In theory, there is no monkey business happening in a hop field.

Hop farmers purposefully create new varieties, breeding two or more existing varieties in a controlled environment to create something new and desirable. A new variety may be the tastiest hop ever created, but if it doesn’t meet certain standards, it will never make it into your pint glass. Beyond aroma and flavor, farmers must consider other attributes; they cannot ignore less fanciful realities like disease resistance and agronomic viability. Disease resistance needs no explanation, but farmers must consider economic motives before planting a new hop variety. Things like crop yield (pounds per acre) and water requirements cannot be ignored. After all, hop farms are businesses.

“Most often, we start out with a goal in mind,” says Jason Perrault, a fourth-generation hop grower in Washington’s Yakima Valley, the largest producing hop-growing region in the country. He is also CEO of Select Botanicals Group, one of the world’s leading hop breeding companies and is recognized as a hop-breeding guru. “Typically, variety development will focus on either trying to bring efficiency to existing brewing profiles or identifying new unique aromatics/flavors or novel combinations of aromatic and flavor compounds,” he says. “Right now we are focused on breeding for efficiency, but also some very innovative aromas including oak/vanilla and distinctly unique fruit aromas that go beyond our traditional notion of hop aromatics.”



BY BRIAN YAEGER

HOPS ACROSS THE GLOBE

Hops are often described as the soul of beer. Moist climates with long sun exposure (latitudes between 45°-51° north or south) make for hop heaven. There are four primary hop production regions and, not surprisingly, they directly correspond with excellent brewing centers. America and Germany compete for the title as the largest hop producer in the world, with the United States holding the mantle last year. Most is concentrated in the Pacific Northwest with Washington’s Yakima Valley far outpacing Oregon’s Willamette Valley. Northwest hops, bred for high alpha acids, deliver aromas and flavors of pine, citrus and stone fruit. Hops such as Cascade, Centennial, and more recently, Citra and Mosaic are ideal for pale ales and IPAs.

Hallertau hops from Bavaria are marked for their floral aromatics and spice, but not bitter flavor. Varietals reverentially referred to as noble hops include Tettnanger, Spalt, Hallertau Mittelfrüh and Saaz. These are the backbone for classic German and Czech styles like pilsner and kölsch, as well as all those delicate wheat/weiss beers.

Most of the beers popular among American craft brewers are inspired by English ale brewers from our beloved IPAs to stouts, ESBs and barleywine. There are hop farms across England but Kent is renowned as the production center and responsible for prototypical UK varietals such as Kent Golding, Fuggle and Brewer’s Gold. UK hops are often fruity and herbaceous.

In Australia, Tasmania and primarily New Zealand, a new found *terroir* is infusing tropical fruit and berry flavors into saisons and what are now called Australian pale ales. Nelson Sauvin, Galaxy and Motueka hops don’t just offer fresh flavors, but since their growing season is the opposite of the Northern Hemisphere’s, they allow for fresher hops during our spring.

Of course, it’s a small world after all, so look for China, Patagonia and some African countries like Ethiopia to create the world’s next favorite hops and hoppy beers.

HOP VARIETIES

There are currently over 150 hop varieties available to brewers. Here are a few of the most popular and most interesting, along with some information about that variety’s origin and a suggested beer that showcases it.

Amarillo

One of the very few varieties that was discovered and not purposefully bred. In 1990 Virgil Gamache Farms in Toppenish, Washington, found a random seed in a newly planted field of Liberty hops. Upon examination, it was determined to be a completely new variety, and a very good one.

PROFILE » Grapefruit, orange, lemon, melon, apricot, peach

SAMPLE BEER » Fremont Brewing Summer Ale

Azacca

Named after the Haitian god of agriculture, the grandchild of two other hop varieties, Northern Brewer and Summit, was introduced in 2013.

PROFILE » Mango, papaya, orange, pineapple, grapefruit

SAMPLE BEER » Diamond Knot Brewing Azacca India pale ale

Cascade

Originally bred in 1956 but not planted significantly until 1972, this is considered the first of all modern aroma hop varieties. It is still widely used, an oldie but a goodie.

PROFILE » Floral, citrus, grapefruit

SAMPLE BEER » KettleHouse Brewing Double Haul India pale ale

Galaxy

Hailing from the Land Down Under, this cross between an Australian and a European variety was introduced in 2009.

PROFILE » Peach, passionfruit, guava, lemongrass

SAMPLE BEER » Seapine Brewing Positron India pale ale

Lemondrop

Developed by crossing Cascade with an unnamed, experimental variety and introduced to the market in 2014.

PROFILE » Lemon, mint, green tea, melon

SAMPLE BEER » Deschutes Brewing Hop Slice summer ale

Mosaic

The daughter of Simcoe (mother) and a Nugget-derived male was introduced in 2012. Highly polarizing because of its intense earthy and savory attributes, it is adored by some and despised by others.

PROFILE » Earthy, floral, tropical, blueberry, bubblegum

SAMPLE BEER » pFreim Family Brewers Mosaic pale ale

Strata

Keep an eye out for this one, a derivative of another hop variety (Perle) that was introduced this year for commercial trials at a small number of breweries. It was developed by hop researchers at Oregon State University, and is quickly earning the admiration of brewers and beer drinkers, and hopefully will see wider production in the coming years.

PROFILE » Mango, passionfruit, lemon, herbal dankness

SAMPLE BEER » Worthy Brewing StrataSphere India pale ale



To create a new hop variety, hop breeders like Perrault decide which varieties to use as the parents and fertilize the mother with pollen from the father. They harvest and germinate the resulting seeds — each of which is, essentially, its own unique hop variety — then study the seeds. After selecting the most viable candidates, they plant the seeds and see what pops out of the earth. From the thousands of seedlings that make it into the greenhouse each year, maybe a dozen are suitable for brewing beer, and only half of those would actually interest the brewing industry.

That's a super-simplified view of the most common hop breeding process; there's actually a lot of big-brain science and technology involved. "To put it into perspective, we generally start with over 20,000 genotypes per year, but we do not necessarily release a new variety every year," Perrault explains. "I often joke that it is a depressing way to make a living because you're throwing away 99.9999 percent of your life's work."

When a new variety is first created and determined to be what Perrault refers to as "Elite," a very small amount of it is planted and studied. If it shows promise, perhaps a little more is planted the following year. If the candidate seems viable, the process continues until they're growing enough to brew some experimental batches of beer. Eventually, if everything goes well, and the brewing industry is interested in it, the new hop

variety is given a name and grown in larger quantities. It typically takes at least 10 years for a new hop variety to find its way from conception to your pint glass.

The next time you hoist a pint of your favorite IPA, marveling at its robust, earthy, fruit-forward, citrusy aroma and flavor, raise a toast to the hop farmers and researchers who developed the hops that you love. From the time it was brewed, it probably only took a couple of weeks for that IPA to be ready to drink, but the hops that make it special took years of hard work and research to develop. ●

THE FINE PRINT

► Characteristics of Aroma Hops

The term "aroma hop" is used a couple of ways. When brewing beer, hops added later in the boiling process to provide flavor and aromatics are often referred to as aroma hops, or late-addition hops. Hops are added earlier in the boil to provide bitterness. Therefore the term also refers to hop varieties that were bred intentionally to provide aromatic and flavoring qualities to beer: hops that were bred for use as late-addition hops. When brewers dry-hop a beer — adding hops after the brewing process has ended, during fermentation and conditioning — they typically use aroma hop varieties.

► The Truth about IPAs and IBUs

A lot of breweries include an IBU number on their label these days. It's a trend that causes some confusion for beer drinkers. The International Bittering Units (IBU) scale is used to measure the actual, not perceived, bitterness of beer. It has more to do with science than it does flavor. The IBU rating probably has nothing to do with the hop-forward flavor you love in a particular beer. Rather, the fruity, floral, citrusy, dank attributes of today's most popular IPAs come from aroma hops. Bitterness is a different subject.

► Coors and the Birth of American IPA

Legend has it that the U.S. Department of Agriculture may have never released Cascade hops, and hop farmers may have never planted it, if Coors Brewing hadn't committed to using it in 1972. This new hop variety was an important ingredient in many of the earliest craft beers, and its success helped drive the creation of more new hop varieties, which in turn helped craft beer gain wider popularity. Craft beer enthusiasts, who typically see the big beer companies as the enemy, owe a debt of gratitude to Coors.

