

Bijlage B: hop profiles

From: highlander@csn.net (Keith Wanless - Highlander Home Brew)
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Admiral (England)

Alpha acids: 11.5-14.5%

Bred as a complement to Target, this high-alpha, high-yielding hop has been successfully used as a bittering and late kettle aromatic hop.

Substitutes - Target, Yeoman, Phoenix

Bramling Cross (England)

Alpha acids: 5.0-7.0%

Developed from the Golding variety Bramling and a wild Manitoban male, this variety has been used in England to produce beers with a lemony, citrusy, slightly sour character. It is drawing increasing interest from craft brewers on both sides of the Atlantic due to this unusual characteristic.

Substitutes - East Kent Golding, Fuggle

Brewer's Gold (Germany, US, England)

Alpha acids: 5.5 - 8.5%

A good bittering hop that has seen its production numbers drop in recent years with the advent of new super alpha varieties, this versatile variety has been used for bittering English ales, and from time to time German lagers and weizens. It has a rather coarse bitterness that, like its cousin Bullion, people either love or hate.

Substitutes - Bullion, Northern Brewer, Magnum

Bullion (US, England)

Alpha acids: 6.5-9.0%

One of the original high-alpha hops, Bullion was bred in England from the same wild hop as Brewer's Gold. It's one of those hops you either love or hate. It has lost a lot of popularity to the newer high alpha hops with superior storage properties.

Substitutes - Northern Brewer, Brewer's Gold

Cascade (US)

Alpha acids: 4.5-7.5%

Without doubt the most popular aroma hop among home- and microbrewers. Cascade was bred by open pollination from Fuggle and Serebrianker, a Russian hop. The signature aroma hop in just about every Pale Ale brewed on the West Coast, it is also frequently used for bittering. Cascade has a distinctive, citrusy-grapefruity character.

Substitutes - none, but Centennial is closest

Centennial (US)

Alpha acids: 9.5 -11.5%

A medium to high alpha dual purpose hop with citrus and floral tones not unlike Cascade. Despite its reputation as "super Cascade," it was bred from Brewer's Gold and a select USDA male. Great to use for bittering if finishing with Cascade as the two complement each other.

Substitutes - none, but Cascade is closest.

Challenger (England)

Alpha acids: 6.5 - 8.5%

A dual-purpose hop introduced in 1972 as an alternative to Kent Golding, Challenger has an aroma which is equitable for the fullest English ales and the finest lagers. Its notable alpha acid content makes it an appropriate bittering hop as well. It is very popular among English home- and craft brewers, and may well become a preferred hop in the US as its availability increases.

Substitutes - East Kent Golding, Target, Yeoman for bittering, East Kent Golding, Fuggle for finishing.

Chinook (US)

Alpha acids: 12.0 -14.0%

Chinook is a super-alpha variety bred by crossing Golding with a USDA male. Its very high alpha acid content makes it an economical bittering hop, but many find its bitterness to be rather harsh. Some Pacific Northwest breweries also use it for finishing and/or dry hopping.

Substitutes - Galena, Eroica, Nugget, Cluster

Cluster (US)

Alpha Acid: 5.5 - 8.5%

A dual-purpose hop with no undesirable flavor or aroma characteristics, Cluster was once the only commercially grown hop in the US. Primarily used for bittering in American lagers, it is also widely used for aroma in Australian ales and lagers.

Substitutes - Galena, Chinook

Columbus (US)

Alpha acids: 14.0-16.0%

Developed by Hop Union's breeding program in Yakima, WA, Columbus is becoming increasingly popular. Primarily used as a bittering hop in such commercial brews as Sierra Nevada's Celebration Ale, this hop is also suitable for finishing and dry hopping.

Substitutes - Undetermined

Crystal (US)

Alpha acids: 2.0 - 4.5%

Released in 1993, this Hallertau triploid is the third of the USDA's sisters (Liberty, Mt. Hood and Ultra being the others) bred to duplicate the Mittelfruh variety on US soil. It has been well received by those who have tried it, but its availability is limited due to the small acreage under vine. It has a pleasant, delicate, noble aroma and works as an excellent substitute for the other Hallertau varieties.

Substitutes - Liberty, Ultra, Mt. Hood, Hersbrucker or Tradition, if you can't find Mittelfruh

East Kent Goldings (England)

Alpha acids: 4.5 - 6.5%

For an authentic IPA or traditional English Bitter, there is simply no appropriate substitute for this king of English hops. Golding is a family of hops grown all over southern England, with the most prized examples being grown in Kent, and particularly the eastern part of that county. The perfect bittering and finishing hop for all types of English Ales.

Substitutes (in order of preference) - US, BC Kent Golding, English Fuggles, Whitbread Goldings, domestic Fuggle or Willamette, Styrian Golding, Target. For something a bit different, try Bramling Cross or Northdown

First Gold (England)

Alpha acids: 7.0 - 8.5%

Developed from Whitbread Golding, this relatively new mid-alpha variety has been compared favorably to Kent Golding. Pleasant bitterness and flowery aroma make this a good all-purpose hop with characteristics not unlike Kent Golding and Fuggle.

Substitutes - Kent Golding, Whitbread Golding, Fuggle

Fuggle (domestic)

Alpha acids: 4.0 - 5.5%

Though not as fine as its English counterpart, domestic Fuggle is an outstanding aroma hop for classic British beer styles.

Substitutes - English Fuggles, Willamette, Styrian Golding, Kent Golding

Fuggles (England)

Alpha acids: 3.5 - 5.5%

Second in popularity and tradition only to East Kent Golding, this is a very traditional English aroma hop developed in 1875. The English version is superior to its American counterpart, and is a parent of the American Willamette hop. It has a lovely, delicate, grassy/flowery aroma. Perfect for dryhopping IPA and Bitter.

Substitutes (in order of preference) - Domestic Fuggle, Styrian Golding, Willamette, East Kent Golding, US or BC Kent Golding

Galena (US)

Alpha acids: 12.0-14%

The most widely cultivated hop in the US, Galena was bred from Brewers Gold by open pollination. Although it is used primarily for bittering purposes, Galena has an acceptable aroma profile without the harsh characteristics of some other high-alpha hops.

Substitutes - Chinook, Cluster, Nugget

Hallertau (domestic)

Alpha acids: 2.0 - 4.5%

A domestically grown transplant of Hallertau Mittelfruh, this superior aroma hop lacks the delicate finesse of the original and the pungency of Hallertau Hersbrucker. Mittelfruh root stocks were brought to this country in hopes of replicating the true noble hop, but the vines simply do not grow the same here as they do in Germany. Since Mittelfruh is extremely difficult to obtain, this is an adequate replacement, but Hallertau Tradition is generally regarded as superior.

Substitutes - Crystal, Liberty, Ultra, Mt. Hood, Hersbrucker or Tradition are all closer in character to Mittelfruh than this hop is.

Hallertau Hersbrucker (Germany)

Alpha acids: 3.0 - 5.5%

The most widely available German aromatic hop, this spicy variety has largely replaced Hallertau Mittelfrueh because of its disease tolerance. A hop with delectable finesse, Hersbrucker is a parent of many American varieties.

Substitutes - Hallertau Mittelfrueh (if you can find it) Hallertau, Tradition, Liberty, Mt. Hood, Ultra, Crystal

Hallertau Magnum (Germany)

Alpha Acids: 10.5 - 14.0%

An excellent high-alpha hop with quite a pedigree! Bred from Galena, Hallertau, Saaz, Spalt, and numerous other hops, this has a character that has been compared to, of all things, Juicy Fruit gum. Although used primarily for bittering, its noble progenitors have endowed it with a very pleasant aroma as well.

Substitutes - Galena, Northern Brewer

Hallertau Northern Brewer (Germany)

Alpha acids: 7.0-10.0%

One of the higher alpha German hops, Northern brewer is a favorite among home brewers, who like its combination of bittering potential and pleasant aroma. A traditional variety for the almost-extinct German ale brewer, it is commonly found in Altbier and Kolsch.

Substitutes - Perle, Magnum for bittering, Hallertau varieties for finishing

Hallertau Perle (Germany)

Alpha acids: 5.0 - 7.0%

Originally bred in England from Northern Brewer, this dual purpose hop features a slightly spicy aroma and mid-range alpha content. Its excellent storage qualities make it a preferred hop among craft brewers.

Substitutes - Northern Brewer, Magnum for bittering, Hallertau varieties for finishing

Hallertau Tradition (Germany)

Alpha acids: 5.0 - 7.0%

More pungent and assertive than its cousin Hersbrucker, this variety is said to bear a striking resemblance to the hard-to-find Mittelfrueh. Rapidly gaining acceptance among German craft brewers, this variety is the perfect finishing hop for continental lagers and weizens.

Substitutes - Hallertau Mittelfrueh (if you can find it) Hallertau, Hersbrucker, Liberty, Mt. Hood, Ultra, Crystal

Kent Goldings (domestic, BC)

Alpha acids: 4.0-5.0%

The "New World" grown version of the quintessential English ale hop, this is nearly as good as the original, though it lacks a touch of the overwhelming floweriness found in the hops grown in East Kent. Excellent for bittering, finishing or both in all English style ales including Brown, Mild, Bitter and Pale ales, Porter and Stout.

Substitutes (in order of preference) - English (East) Kent Golding, English Fuggles, Whitbread Goldings, domestic Fuggle or Willamette, Styrian Golding

Liberty (US)

Alpha acids: 3.0-6.0%

The 1991 product of the Hallertau breeding program, Liberty is a fine, commonly available alternative to the hard-to-find Mittelfruh. A sister of Mount Hood, Crystal and Ultra, this excellent aromatic hop is well worth trying.

Substitutes - Crystal, Ultra, Mt. Hood, Hersbrucker or Tradition

Lublin (Poland)

Alpha acids: 3.0 - 4.5%

A clone of Saaz grown in Poland, this softly spicy, resinous hop has very desirable characteristics for bittering and finishing all kinds of continental lagers. Also an excellent aroma hop for wheat beers.

Substitutes - Saaz, Spalt, Tettnang

Mt. Hood (US)

Alpha acids: 4.0-8.0%

The first of the USDA's Hallertau breeding program to be released, this sister of Liberty, Crystal and Ultra is an adequate, commonly available substitute for Mittelfruh, though it lacks the subtle nature of the original.

Substitutes - Crystal, Liberty, Ultra, Hersbrucker, Tradition, Domestic and Hallertau

Northdown (Ireland, England)

Alpha acids: 7.2-9.0%

A first generation selection from Northern Brewer crossed with a mildew resistant German male, this is now the third most prominent hop in England and the most cultivated in Ireland. Its relatively high alpha acid content and pleasant flavor and aroma make it an excellent all-purpose choice.

Substitutes - East Kent Golding, Fuggle

Northern Brewer (US, Germany, England)

Alpha acids: 8.0-10.0%

Northern Brewer was bred in England from Hallertau Mittelfruh but is now grown primarily in the US and Germany. The German is far superior to the domestic. The most famous example of its use is Anchor Steam Beer, in which it is the exclusive hop. One of the original high alpha hops (though not by today's standards) it is a close relative of Perle with highly regarded qualities for both bittering and aroma.

Substitutes - Perle

Nugget (US)

Alpha acids: 12.0-14.0%

A super-alpha hop with a heavy, herbal aroma, Nugget was bred from Brewer's Gold and a high alpha USDA male. Popular among microbrewers, it is less so among homebrewers due to the availability of other high alpha hops with a bit more finesse.

Substitutes - Galena, Chinook, Cluster

Oregon Fuggles (US) - [JH]

Alpha acids: 4.5-5.5%

A chance seedling in 1875 England but now grown in the U.S. It is known as a traditional aroma hop with a mild and pleasant spiciness. Not considered quite as good as English Fuggles but still a very nice aroma hop just the same. It is a finishing hop that some brewers just can't do without.

Substitutes - Fugglesout.

Oregon Kent Goldings (US) [JH]

Alpha acids: 4.0-5.0%

The long established English East Kent Goldings now grown in the U.S. East Kent Goldings is the undisputed finest ale hop in the world. Thus far the feedback has been very favorable with the opinion that it ranks extremely close to the English grown hop. It has a mild and very pleasant hoppy nose. This hop used alone or in conjunctions with Fuggles should produce a winner every time.

Substitute - English East Kent Goldings

Phoenix (England)

Alpha acids: 8.5-11.5%

Developed along with Admiral from the Yeoman seedling, this is an excellent alternative to other English high-alpha varieties.

Substitutes - Target, Yeoman, Admiral

Perle (US, Germany)

Alpha acids: 7.0-9.5%

Bred in Germany as a disease-resistant replacement for Hallertau Mittelfruh, Perle is a fairly popular mid-alpha bittering hop. Used also from time to time as an aroma hop, it has a spicy, pleasant aromatic character. Suitable for use in everything but the palest lagers.

Substitutes - Northern Brewer

Pioneer (U.K.) [JH]

Alpha acids: 8.0-10.0%

This is a dual purpose hop with breeding lines mostly from Wye Omega, and distantly Wye Yeoman and is a sister of Herald. It has a typical hoppy English flavor and aroma.

Pride of Ringwood (Australia)

Alpha acid: 7.0 - 10%

Australia is a place renowned for its unusual wildlife and totally independent ecology. Another thing going for it is that diseases and pests that affect hop cultivation don't exist there, making Pride of Ringwood one of the few totally organic hop varieties available. Once the highest alpha hop in the world, this is the signature variety in the popular Foster's lager.

Substitutes - Centennial, Galena, Cluster

Progress (England)

Alpha acids: 5.0-7.5%

Derived from Whitbread Golding, this variety was introduced as a more vigorous alternative to Fuggle. It has a pleasant, subtle aroma, and provides a soft, delicate bitterness.

Substitutes - East Kent Golding, Fuggle, Whitbread Golding

Saaz (Czech Republic, US)

Alpha acids: 3.0 - 4.5%

The undisputed King of the Pilsner hops, Saaz is the only hop used in the original (and still finest) Pilsner in the world, Pilsner Urquell. Resiny, softly spicy flavor and aroma, delicately refined. The Czech version is far superior to its American cousin. Clones are grown in Poland (see Lublin) and the Ukraine. Superbly appropriate for all continental lagers.

Substitutes - none highly recommended, but Lublin, US Saaz, Spalt, and the Hallertau varieties are all very nice in their own right.

Spalter Select (Germany)

Alpha acids: 4.0 - 6.0%

Released in 1991, this disease-resistant daughter of Mittelfruh and Spalt has a Spalt-like, spicy aroma. Not widely available in the US.

Substitutes - Spalt, Hallertau varieties, Saaz

Spalt Spalter (Germany)

Alpha acids: 4.0-5.5%

A noble hop with Saaz origins, this flavorful, aromatic hop is the second most widely grown variety in Germany, although it is not widely available in the US. A pungent and spicy aroma make this perfect for finishing German lagers and weizenbiers.

Substitutes - Czech Saaz, Spalter Select, Hallertau varieties

Strisselspalt (F) [JH]

Alpha acids: 3.0-5.0%

A major aroma hop of the Alsace area of France near Strasbourg. It is a well accepted aroma hop around the world and is very pleasant and hoppy.

Substitutes - Hersbrucker

Styrian Golding (Slovenia section of former Yugoslavia)

Alpha acids: 4.0-6.0%

A transplanted English Fuggle, the warmer climate and different soil of the former Yugoslavia have endowed this variety with a character all its own. Despite the name of this world renowned and much sought after variety, these hops are not a relative of Golding. A very pleasant hop with grassy, flowery character, this is commonly used to bitter Belgian ales, and for aroma in English ales.

Substitutes - Fuggle, Willamette

Super Styrian (Slovenia) [JH]

Alpha acids: 3.0-6.0%

Don't confuse these with Styrian Golding. It is actually made up of four different varieties Atlas, Apolon, Ahil and Aurora. It is mainly used for bittering but does have some interesting flavor and aroma characteristics.

Target (England)

Alpha acids: 10.5-12.5%

With more acreage under cultivation than any other variety, Target is the production leader in England, accounting for up to 40% of the annual hop harvest. Its high alpha content makes it economical to use, and it also has a very pleasant aroma that has been likened to that of its parent, Northern Brewer. A growing number of English brewers now use it for dry hopping in addition to kettle hops.

Substitutes - East Kent Golding, Fuggle for aroma, Yeoman, Admiral for bittering

Tettnang (domestic)

Alpha acids: 3.0 - 5.0%

A German noble hop transplanted to the US, Tettnang grows better and retains more of the character of the original than most European varieties. A mild, slightly spicy aroma hop, Tettnang is an excellent finishing hop for Continental lagers.

Substitutes - Spalt, Czech Saaz or Tettnang Tettnanger

Tettnang Tettnanger (Germany)

Alpha acids: 3.0 - 5.0%

The quintessential hop for German-style lagers, this noble variety from the Tettnang region of Germany is considerably more refined than the American version. Mild, spicy aroma and fine delicate flavor.

Substitutes - Hallertau Mittelfrueh (if you can find it) Hallertau Tradition, Hallertau, Hersbrucker, Spalt, domestic Tettnang

Ultra (US)

Alpha acids: 3.0 - 6.0%

The most recent release of the Hallertau breeding program, Ultra is regarded as being the closest of the USDA's sister hop varieties to the German Mittelfruh. Like most new varieties, its availability is spotty, but should improve as it becomes more widely accepted and more acreage is cultivated.

Substitutes - Liberty, Crystal, Mt. Hood, Hersbrucker or Tradition

Whitbread Goldings (England)

Alpha acids: 5.5-7.5%

Not a true Golding variety, Whitbread Golding was bred in England in 1911 from an open pollination of Bates Brewer. This hop came to prominence in the 1950's when verticillium wilt drastically reduced the Kent Golding and Fuggle crops. A good all-purpose aroma hop, this lacks the fineness of Kent Golding.

Substitutes - East Kent Golding, Fuggle

Willamette (US)

Alpha acids: 4.5-7.0%

A triploid Fuggle seedling with characteristics similar to the domestic Fuggle, Willamette is a very pleasant aromatic hop. Widely used by micro- and homebrewers, Willamette has a slightly spicier character than English Fuggle. With lots of acreage devoted to this variety, it accounts for over 20% of total U.S. commercial production.

Substitutes - Fuggle, Styrian Golding, BC Kent Golding. For a superior substitute, try East Kent Golding.

Yeoman (England)

Alpha acids: 8.0-12.0%

Introduced in 1980 as a complement to Target in wilt affected areas, Yeoman has found increasing acceptance among brewers who prefer its superior storage and excellent bittering qualities. A very pleasant bittering or late kettle hop.

Substitutes - Target, Admiral, Phoenix

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