

Farm, Fruit, Beer: Getting the most from your Fruit (Beer)

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Overview

- Introduction
- Why Fruit (Beer)?
- The Fruit Farm
- Types of Fruit Products
- Sourcing
- When & How to add Fruit in Brewing Process
- Dosage Recommendations
- Why Les Vergers Boiron
- Questions



Introduction

- Bret Kollmann Baker
 - Co-founder at Urban Artifact in Cincinnati, OH
 - Largest brewery fruit user in the USA
 - Should hit 1,000,000 lbs of fruit used this year alone
 - Beer Ambassador for Boiron America's
 - Has largely focused on pastry, chef, and bar use up until now
- Presentation will try to cover all aspects of using fruit but will largely focus on the use of fruit purees.

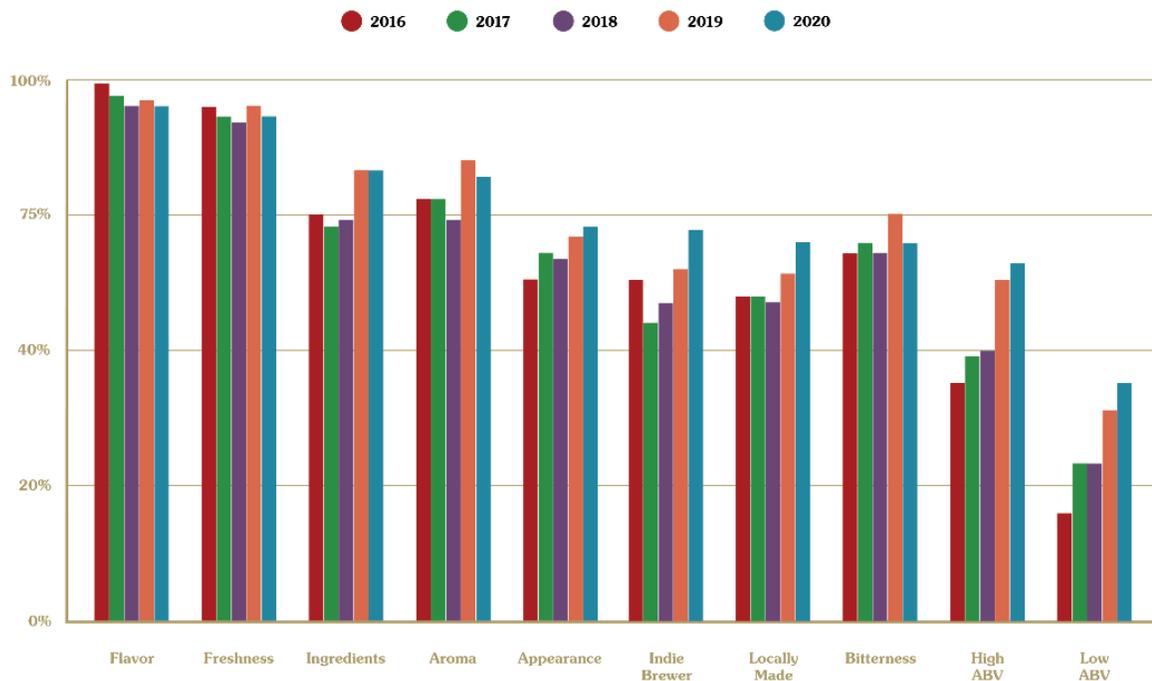
Why Fruit?

- Growing beer style
 - 2nd fastest growing style (behind IPA)
 - 5.5% of the market currently (via IRI data)
 - Both by dollar and by volume
 - Greater accessibility to occasional beer drinkers and non-standard craft
 - Younger-skewing
 - Tastes freaking great
 - (easy to understand) Flavor reigns supreme
- Unlimited innovation opportunities:
 - Style variants & New Opportunities
 - New and unique fruit offerings
 - Skills translate to FMBs, RTDs, and Seltzers



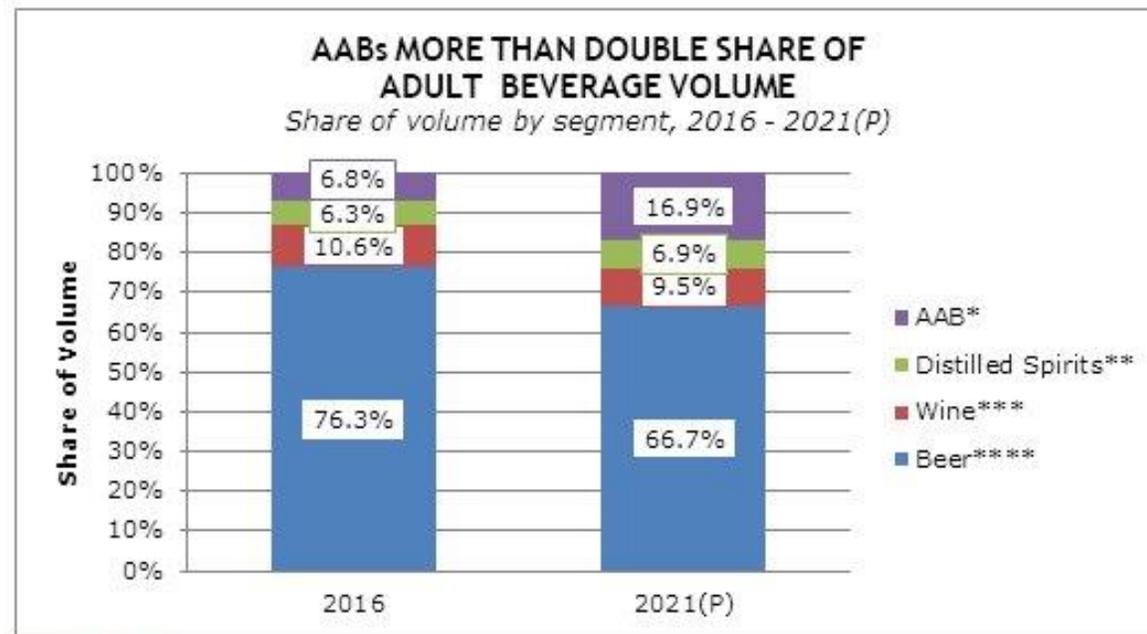
Why Fruit?

Importance of Beer Attributes When Choosing a Craft Beer



Source: Nielsen/Brewers Association

Fig. 1 & 2. Flavor continues to be the #1 most cared about attribute, and fruit provides readily understandable, easy to relate to flavors. The flavor expectations are set and understood easily for consumers. This can partly explain the rise of AABs, and the opportunities that exist in craft beer to use fruit to achieve a similar effect.



(P) Projected

* Adult alternative beverages (AABs) include low- and zero proof spirits, ready-to-drink and frozen cocktails, canned wine and wine-based cocktails, wine coolers, flavored malt beverages, hard cider, hard kombucha, hard coffee and cannabis-based drinks.

** Excludes low- and zero-proof spirits as well as ready-to-drink (RTD) and frozen cocktails.

*** Excludes canned wine, canned wine-based cocktails and wine coolers.

**** Excludes flavored malt beverages and hard cider.

Source: Beverage Marketing Corporation

The Fruit Farm

- More intensive start-up than cereal farming
- Varietal Specific Risk & Reward
- Customers
 - Grocery (fresh and/or frozen), Manufacturing & Contracts, “The market”
- Customer dictates harvest timing
 - Fresh is almost never picked ripe. Transport, storage, and best-buy timing demand pre-ripe harvesting
 - Lower quality for you the brewer. Looks matter (but really, they don't)
 - Frozen and Manufacturing almost always mean a picked ripe product
- Farm → Harvest → Process
 - If this is for frozen or bulk product this almost always happens within 100 miles or less
 - Boiron handles all puree manufacturing in house
 - Does lead to increased transport costs, but the quality control gained is worth the squeeze

Types of Fruit Products

- Fresh
- Frozen
 - IQF or Straight Pack (normally whole fruit)
- Puree
 - Aseptic or Frozen
 - Single Strength, Sugar Adjusted, Sugar Added
- Juice
- Fruit Concentrates
- Dehydrated
- Freeze-Dried
- Extract & Essence



Types of Fruit Products

Type of Fruit Product	Pros	Cons	Production Considerations	Styles (best) Appropriate for
Fresh Fruit	Usually local, seasonality, “authentic”, least amount of handling and processing	Limited availability, prep work, seeds, variable quality, microbial risk, short shelf life, high product loss	Seed and solid removal are the upmost importance for product consistency. Look to wine-making for tips/tricks. Dilution.	“Traditional” sours BA beer Anything where the price can absorb the added labor and loss
Frozen (whole) Fruit	Picked ripe, no seasonality, Can get IQF or Straight Pack, cheaper than fresh w/ better flavor impact	Seeds!, Thaw time and frozen storage requirements, pack format.	Similar issues to fresh but usually less prep work. Can buy sliced, pieces, splits, whole, etc. Dilution.	“Traditional” sours BA beer Anything where the price can absorb the added labor and loss
Dehydrated	No water weight or dilution. Can buy powders, pieces, whole	“cooked” flavor. Will absorb beer and lead to high loss. Often sugar added, sometimes flavor added. Often contains preservatives	High beer loss and removal of solids is a PITA. Wetting if using a powder is troublesome.	I personally can’t really recommend this. Could probably try for some avant-garde beer like a fruit leather bock or equally out-there
Freeze Dried	No water weight or dilution. Can buy powders, pieces, whole. Retains flavor better as a no-heat process. 11:1 ratio fresh:dry	Hella expensive (moreso than buying equivalent in SS). High loss.	High beer loss and removal of solids is a PITA. Wetting if using a powder is troublesome.	Experimental styles or for hard-to-find exotic fruits (like maqui berry or acai)



Types of Fruit Products

Type of Fruit Product	Pros	Cons	Production Considerations	Styles (best) Appropriate for
Puree	Full flavor spectrum w/o the seeds, best price for flavor impact, readily available	Can be difficult to pump/move, requires some solids removal (higher loss)	Can come aseptic or pasteurized. If buying in drums or totes, some fruit will require a high viscosity pump. Dilution	Any
Juice	Easy to use, clarified means no loss from solids, large amount of options	Lacks flavor depth and color impact (no skins), will need to use more to account for difference.	Small pack is hard to find, drums and totes are common,	Any
Fruit Concentrate	Shelf stable, low loss, less water/dilution factor, cheaper	Aromatically dull, lacks flavor complexity (lack of skins)	High levels of sugar (often around 60 brix+), thick and difficult to pump at all	Any
Extracts, Flavorings, Essences	Aromatically intense, great for "topping up" aromas, cheapest	One-noted, highly processed, can be seen as "fake".	Lacks actual "flavor" as most of these are aromas.	Any

Fruit Purees

- What is a Fruit Puree?
 - A fruit puree is simply crushed up whole fruit into a consistent, often flowable, texture.
 - USDA requirements: Type, variety (as applicable), acidification (normally for color protection), style (SS or Concentrate), Seeds, Sweeteners, package type, and agricultural practices
 - Does not legally need to contain skins according to the USDA, so ask your supplier if it does! That is where all the flavor is, otherwise just use a juice.
 - “Fruit Puree” \neq “non-fruit adjective” Puree
 - Check ingredient statements and be on the lookout for potentially troubling phrases “made with”, “made of”, “contains fruit”, even “natural” is misleading.
- Type & Variety
 - Fruit Used (Type I – Type XIX)
 - Variety is called out for certain fruits, usually an “A” or “B” situation. (ex. Blackberry is called out as “A” Marion or “B” Evergreen)
- Acidification
 - Often done for color protection as citric acid (banana almost always has acid added)
 - Not really an issue and doesn’t impact pH significantly (in a perceived way) in beer
- Style
 - Single Strength
 - No water removed
 - Concentrate
 - Water removed
- Seeds
 - With or without
- Sweeteners
 - Sugar added
 - Standardized vs. Sweetened
 - No Sugar Added



Ingredient (s)

Raspberry 100%

Competitor’s Puree

Ingredients: water, cane sugar, dextrose, fructose, mango, natural flavour. May contain milk, tree nuts, peanuts, soya, egg & wheat.



Fruit Purees

- Aseptic Purees:
 - Uses high temperatures for a longer period
 - Allows for a broader range of packaging options
 - Can alter the color, flavor and aroma of the fruit and make it taste “cooked”
 - Get Samples before committing to a new supplier or even fruit.
 - Recommended for some fruits that help from a longer cook to bring out flavor. Blueberries and strawberries both can benefit
- Pasteurized Frozen Fruit Purees:
 - Flash Pasteurization
 - High temperature, short time (HTST) method to eliminate pathogens and extend shelf life
 - Usually 15-30 seconds (or less)
 - Maintains color, flavor and aromas
 - Boiron’s combination of flash pasteurization and rapid deep freezing preserves the natural taste of the fruits and allows for a 30 mos. shelf life frozen, 15 days refrigerated (after thawing)
 - The rapid deep freezing step cannot be overstated. Truly makes a difference and is the main reason larger format packaging doesn’t exist yet. Much like when boiling eggs, you need to rapidly cool the egg to prevent over cooking. Boiron does not do bulk ambient freezing, which better preserves finer aromatic and flavor compounds. Its this rapid cooling affect that also elevates Boiron’s aseptic line of purees above the competition as well.
- Unpasteurized Frozen Puree
 - Not readily available, good for some fruits if you can find it.

Sourcing Fruit

- Local farmer
 - Largely fresh, whole fruit only. Benefit is picked ripe, with the lowest amount of processing
 - Ex. Local farmer's market is a great place to network
- "National" Farmer
 - Working directly with a farmer, even if not close to you, means more control over what exactly you're buying. Early season crop vs. late, varietal specific, specialty production potential
 - Ex. King Orchards in MI (best damn balaton cherries I've ever had)
- Puree Manufacturer
 - Manufacturer of fruit purees. Traceability all the way back. Will have more information on processing, additives (if used), and packaging. Best option for puree quality combined with one-stop shopping
 - Ex. Les Vergers Boiron
- Puree Supplier
 - Wholesale supplier of purees. Often contracts out production or will buy bulk from farmers co-operatives.
 - Ask your potential supplier how their product is produced.
- Fruit Products & Flavor Companies
 - Fruit concentrates, extracts, essences, etc. Downstream product supplier.
 - Ex. TreeTop (concentrates) and its subsidiary NW Naturals

When to add fruit to beer

- In the boiling process (DON'T DO THIS)
- During fermentation
 - Shelf stable, decreased fruit impact
- Post-fermentation
 - Will need stabilization
 - Sodium Benzoate, Sulfites, Sorbates, Sterile Filtration, Velcorin, Heat Pasteurization, or PEF
 - Chemical or Filtration alone generally not reliable enough
 - Gives a more intense “fresh fruit” experience this way
 - People also love sugar! This type of production is quite popular, for better or worse
- Fruit added to beer will dilute your beer. Most fruit is less sweet than wort. IT IS NOT ADDITIVE

Dilution Calculation

$$\bullet \textit{TargetOG}_{combined} = OG_{wort} * \left(\frac{Vol_{wort}}{Vol_{fruit} + Vol_{wort}} \right) + OG_{fruit} * \left(\frac{Vol_{fruit}}{Vol_{wort} + Vol_{fruit}} \right)$$

- Use same units for gravities. Use same units for volume. Solve for OG(wort)
- If not fermenting your fruit, drop the OG(fruit) portion of the equation

How to add (remove) fruit puree to (from) beer

Add

- Puree in Bags, Boxes, Buckets (applies to whole fruit)
 - Can be dumped into the top of the tank
 - Will raise your DO
 - Can be dumped into most hop dosing equipment
 - Generally, a PITA, but it's the nature of the beast
- Puree in Drums & Totes
 - Drum or Tote pump required
 - Progressive cavity pump of some style

Remove

- If only puree, centrifuge can work.
 - Go slow! Drop Slop prior to 'fuge
 - Will get 97%+ package yield
- If settling/decanting, use bentonite or other fruit specific clarifying agent.
 - We saw about 10% loss with this method
- If whole fruit, a pump over cart is a minimum necessity. May even want a wine press!
 - Use CO2 blankets and transfer while fermentation is active
- Or don't remove it all if you want it thick.
 - Beware the settling



Technical Data



SL-HC	SL-HC	RE 88 PP	RE 88 SS MP SL-PP	MP MS-PP	MP MS-SS	B70V-SR	B70V-SR	Pump tubes
42-R	42-L	40-L	41-L	50/41-L	41-R	25.1 PTFE	25.1 PTFE	
SL	SL	MS	MS	MS	MS	Packed Gland	MS	Mechanical Seal (MS) Sealless (SL)
248 °F	248 °F	122 °F	212 °F	122 °F	212 °F	284 °F	284 °F	Max. Temperature
Rotor	Impeller	Impeller	Impeller	Impeller	Rotor	****	****	Type of impeller
Yes	Yes	No	Yes	No	Yes	No	Yes	Zone 0
54	28.5	17.5	20	24	49	▲	▲	Quantity*Up to GPM
40	66	43	56	69	36	▲	▲	Delivery head* Up to FT
600/1000	1000/1200	1300/1500	1000/1400	1000/1200	300/600	25,000	25,000	Viscosity** Up to cps
1.5	2.0	2.1	2.0	2.0	1.5	*	*	Spec. gravity*** Up to
16.7	16.7	10	15	10	14.3	26.0	26.0	Weight lbs.
54.5	29	16	20	23	51	▲	▲	Quantity*Up to GPM
36	68.5	42.5	62	69	29.5	▲	▲	Delivery head* Up to FT
300/900	500/1100	1200/1400	500/1000	500/900	100/300	20,000	20,000	Viscosity** Up to cps
1.1	1.4	1.9	1.4	1.4	1.1	*	*	Spec. gravity*** Up to
15.9	15.9	9.1	14.1	9.1	13.5	23.5	23.5	Weight lbs.
48	25	15	16	21	45	▲	▲	Quantity*Up to GPM
31	52.5	36	46	56	28	▲	▲	Delivery head* Up to FT
100/600	400/1000	1000/1200	400/800	600/1000	100/200	20,000	20,000	Viscosity** Up to cps
1.2	1.6	1.7	1.6	1.6	1.2	*	*	Spec. gravity*** Up to
21.6	21.6	14.8	19.8	14.8	19.2	29.0	29.0	Weight lbs.
53	26	16	18	23	52	▲	▲	Quantity*Up to GPM
33	42.5	36	43	69	33	▲	▲	Delivery head* Up to FT
850/850	1100/1100	1600/1600	1200/1200	1100/1100	400/400	50,000	50,000	Viscosity** Up to cps
1.2	1.6	1.7	1.5	1.6	1.2	*	*	Spec. gravity*** Up to
13	13	6.2	11.2	6.2	10.6	20.5	20.5	Weight lbs.



Dosing Guidance

A general guide to fruit usage rates

	Beer First Flavor (fermented)			Fruit First Flavor (fermented)			Post-fermentation fruit additions		
	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl (≥)	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl (≥)
Orchard Fruit	10	20	31	40	77.5	115	23	50	75
Tropical	8	15	23	30	62	93	20	40	62
Berries	5	10	15	20	40	62	15	31	45
Citrus	1.5	3	5	10	20	31	5	10	15

Why Les vergers Boiron?



Family-owned company

Alain Boiron's grandfather started the company in 1942



First brand to invent the frozen fruit purees in 1970 with raspberry puree in a 1 kg bag.



Consistent flavor and recipe. Our fruits, harvested at maturity, undergo a unique blending technique that guarantees product consistency throughout the seasons.



Quality of sourcing. Our experts only select the finest varieties of fruit from the best regions worldwide.



Natural product that is non-GMO, has no added colors, thickeners or artificial preservatives.



Widest range of 100% no-sugar-added products in the frozen fruit puree market compared to competitors.



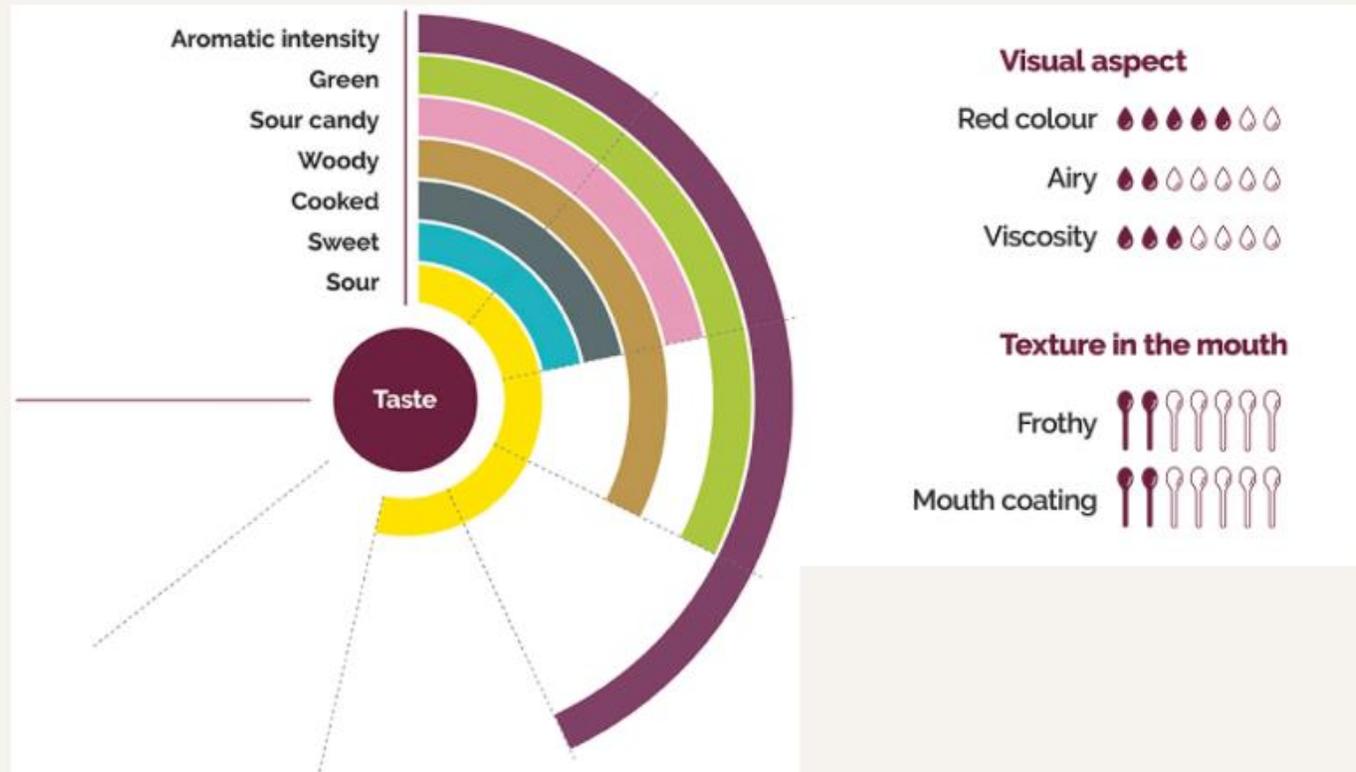
Fruitology

- The science of Fruit Puree.
- A tool developed by Boiron to better help describe and understand fruit purees and their use in beer and the culinary world.
- Sensory & Evaluation Techniques
- Aromatic Typology & Profiles
- <https://www.my-vb.com/us/fruitology>

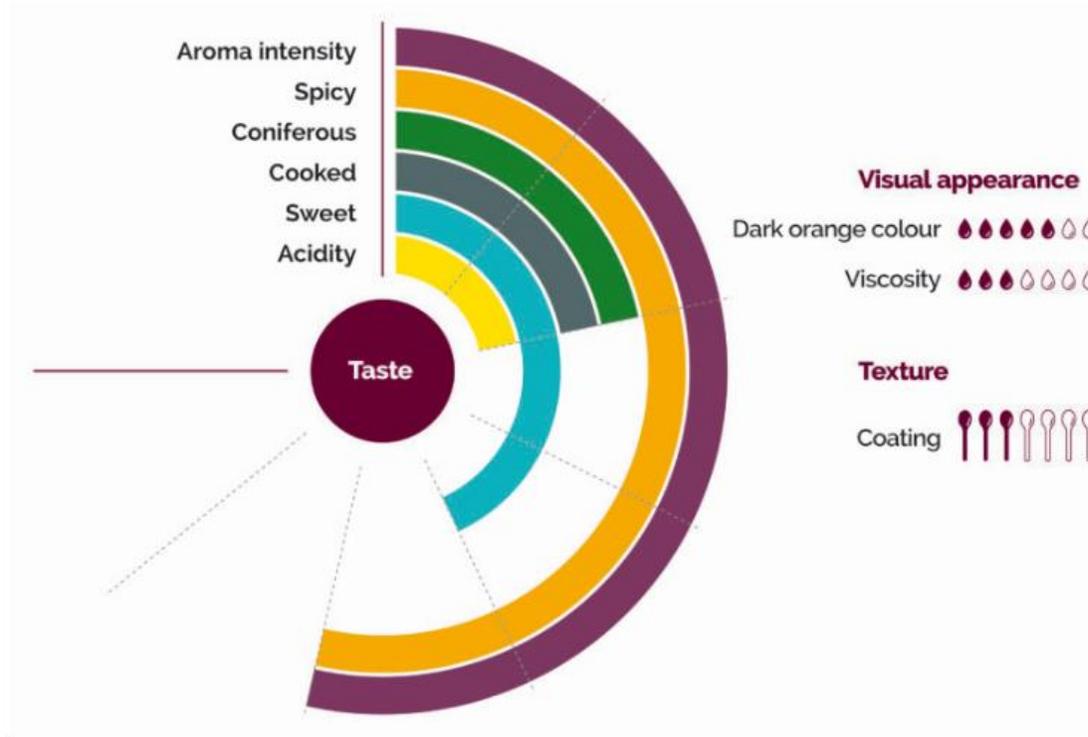


Boiron Fruitology® Sensory Evaluation Tool: Raspberry

Organoleptic characteristics



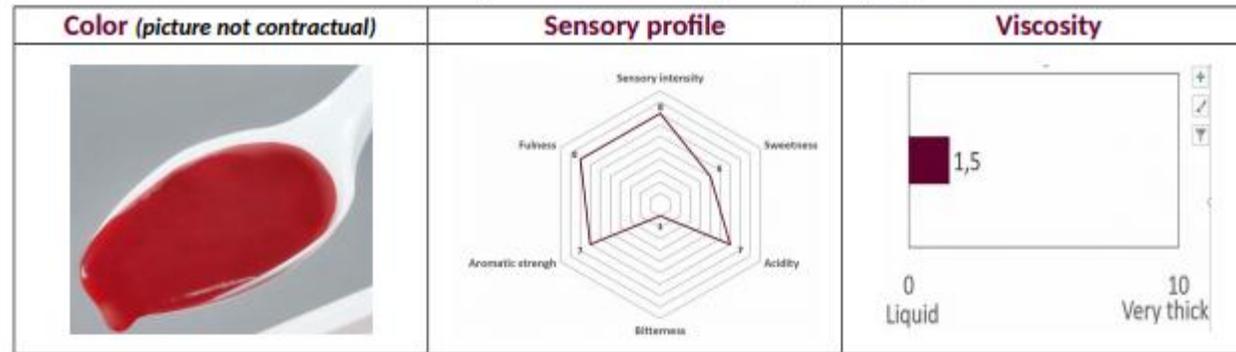
Fruitology[®] Sensory Evaluation Tool: Mango



Boiron Raspberry Technical Specifications



TECHNICAL SPECIFICATION Frozen Fruit puree with added sugar: Raspberry 1kg



Physico chemical characteristics:

	Target value	Tolerance	Unity
Brix	20	+/- 1	° Brix
pH		2.80 - 3.40	
Humidity (For information only)	77,99	+/- 1,5	%

Organoleptic characteristics:

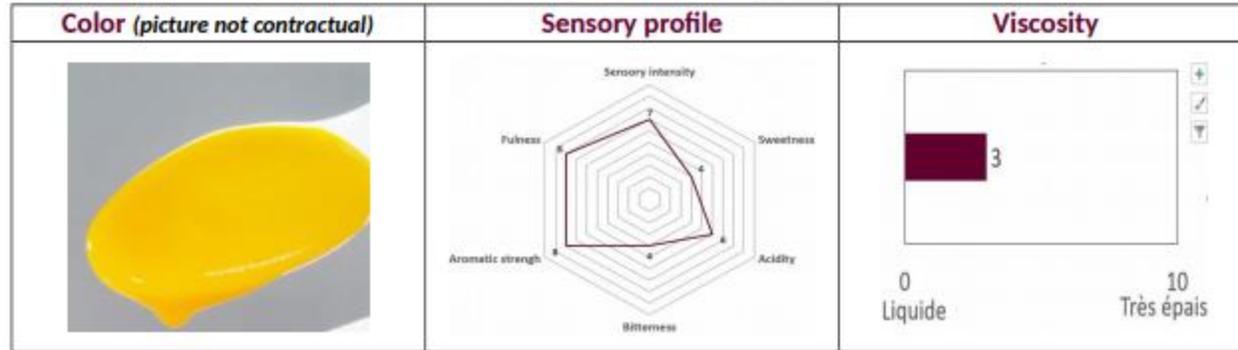
Color:	dark red
Taste:	Acidulated, fresh, intense, persistent aroma. Woody note
Texture:	semi-thick

Boiron Mango Technical Specifications



TECHNICAL SPECIFICATION

Frozen Fruit puree 100%: Mango 1kg



Physico chemical characteristics:

	Target value	Tolerance	Unity
Brix	19	+/- 2	° Brix
pH		3.60 - 4.20	
Humidity (For information only)	78,36	+/- 1,5	%

Organoleptic characteristics:

Color:	orange
Taste:	Sweet, intense, persistent, coniferous
Texture:	semi-thick

Flavor table

	Added sugar		100% purees		100% organic
	Tray 1 kg	Bucket 10 kg	Tray 1 kg	Bucket 10 kg	Bucket 10 kg
Red Fruits					
Blackberry	●				● New!
Blackcurrant	●	●			
Black cherry			●		
Blueberry	●				
Cranberry & Morello	●				
Morello Cherry	●				
Raspberry	●	●	● New!		● New!
Redcurrant	●				
Red berries	●				
Strawberry	●	●	● New!		● New!
Wild Strawberry	●				
Fruits of the orchard					
Apricot	●	●			
Blood peach	●				
Chestnut and Vanilla	●				
Dark red plum			●		
Fig			●		
Green apple	●				
Melon	●				
Mirabelle plum			●		
Pear	●				
Rhubarb			●		
Watermelon			●		
White Peach	●				
Tropical Fruits					
Banana			●	●	
Coconut	●	●			
Coconut Cream			● New!		
Guava	●				
Kiwi			●		
Lychee	●				
Mango			●	●	● New!
Papaya	●				
Passion fruit			●	●	● New!
Pineapple			●	●	
Pomegranate			●		
Specialty lemongrass			●		
Specialty with ginger*			●		
Tropical fruits	●				
Citrus Fruits					
Bergamot			●		
Blood orange			●		
Lemon			●	●	● New!
Lime			●		
Mandarin			●		
Orange & bitter orange			●		
Pink grapefruit			●		
Yuzu			●		
Single-origin PGI Fruits					
Corsican Clementine			● New!		
Siracusa Lemon			● New!		
Sicilian Blood Orange			● New!		

*Contains some candied ginger pieces

Convenient packaging for Craft Breweries

10 kg buckets



Available Flavors:

Blackcurrant, Raspberry, Strawberry, Apricot, Banana*, Coconut, Mango*, Passion Fruit*, Pineapple*, Blood Orange*, Lemon*

Coming 2021: Organic Strawberry*, Organic Raspberry*, Organic Blackcurrant*, Organic Mango*, Organic Passion Fruit*, Organic Lemon*

*No added sugar



		Beer First Flavor (fermented)			Fruit First Flavor (fermented)			Post-fermentation fruit additions			Notes	Recommended Styles
		Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl		
Berries	Black Cherry	6.65	13.3	19.95	26.6	53.2	82.46	19.95	41.23	60	The Black Cherry is a fruit that largely derives it flavor from sugar, so when fermenting with this fruit, make sure to use more than normal, as once you ferment out all the sugar there wont be much flavor intensity left. When using this fruit post fermentation, this fruit will benefit being blended with something a bit more acidic to add some balance and complexity.	Anything post-fermentation
	Blackberry	5	10	15	20	40	≥62	15	31	45	Blackberry is a wonderful fruit on its own but also works excellent as a foundation for building a fruit blend. Its a strong fruit, but doesnt overpower, and in that way it plays well with others. Look to either match intensity with things like plum or black cherry, or to contrast with something loud like lime, pineapple, or black currant.	Sours, Belgians, Stouts/Porters, British Beers, Lagers. The bitterness of IPA can clash.
	Blackcurrant	2.5	5	7.5	10	20	31	7.5	15.5	22.5	Black currant is an intensely flavored, and colored, fruit, not needing much for a large impact. A citric acid heavy fruit, this fruit can be used to accetuate acidity and give a candy like impression. A European favorite, this fruit is sure to make an impression in any beer you make. Use a touch of this with a strawberry beer to brighten the color and add a pop of acidity	Classic british styles, BA stouts, traditional sours. Post fermentation if used with other fruits for balance
	Blueberry	7.5	15	22.5	30	60	93	15	31	45	Blueberries are defined by sweetness and acidity. Once you remove the sugar through fermentation, there isnt much flavor left to stand on. This fruit shines most when its used post-fermentation. If fermenting out dry, be sure to use more than you would otherwise think for ideal impact.	Anything post-fermentation. In lighter beer styles if used in fermentation.
	Cranberry & Morello Cherry	4	8	12	16	32	49.6	12	24.8	36	The cranberry is acidic and tannic, which makes it a wonderful fruit for fermentation. Blended with the morello cherry for added complexity and flavor relateability, this is a combination that works wonderfully in any application. Bright red, bright and crisp flavor, and balanced nicely with a tannic finish. A brewer favorite blend.	Works well in almost any style. Can overtake lighter beer styles.
	Morello Cherry	5	10	15	20	40	≥62	15	31	≥45	A classic! The ancestor of most classic brewing cherries. Dark in color, tart and bright in flavor, with just a touch of cherry skin tannic character makes this cherry the perfect all rounder. Works wonderfully in any situation.	Works well in any style or use
	Raspberry	5	10	15	20	40	≥62	15	31	≥45	Punchy, aromatic, and acidic, the red raspberry is an all american favorite. This fruit tends to sit on top of other more tame fruits, yet is great for blending or on its own. Look to either match intensity if blending with something like lemon or passion fruit or use in a smaller quantity with quieter fruits like mango or strawberry.	Works well in any style or use
	Redcurrant	5	10	15	20	40	≥62	15	31	≥45	More tame than its cousin, the black currant. The red currant is surpisingly understated. Acidic, yes, but not too sweet and relatively mild aromatics. Works well enough on its own, but truly shines when used in a fruit blend.	Best for use in lighter styles that also benefit from additional acidity. Pre-pro american lagers are a great use.
	Red Berry Blend (blackberry, strawberry, blueberry, black currant)	5	10	15	20	40	≥62	15	31	≥45	This mixed berry blend brings in the best and brightest of the berry world. Specially created to highlight the best aspects of each fruit, this mixed berry puree is an easy win for your next beer.	Works well in any style. Great for post-fermentation addition
	Strawberry	7.5	15	22.5	30	60	93	15	31	≥45	The strawberry behaves more like a melon when fermented than a berry. Large amounts of fruit are required to retain the jam like qualities of this puree if used during fermentation. Ideal use rate is either almost double the standard berry in fermentation and the addition of vanilla will help highlight its jamminess. Post fermentation is where this fruit truly shines. Add a touch of black currant to make the color pop without adding a noticeable flavor impact.	Ideal for post fermentation additions. Use in lighter styles if fermenting.
Wild Strawberry	6.65	13.3	19.95	26.6	53.2	82.46	15	31	≥45	A bit smaller than its domesticated cousin, the wild strawberry has more skin to pulp ratio thereby giving it a bit brighter color and a bit more intense flavor. Less is needed for a similar impact. The extra skin:pulp ratio further adds depth and complexity to this berry. A true coinessiours delight.	Ideal for post fermentation additions. Use in lighter styles if fermenting.	

	Beer First Flavor (fermented)			Fruit First Flavor (fermented)			Post-fermentation fruit additions			Notes	Recommended Styles	
	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl			
Tropical Fruits	Banana	12	22.5	34.5	45	93	139.5	20	40	≥62	Banana is probably the best example of a fruit that is almost entirely suited for post-fermentation editions. Light aromatics, flavor that is largely derived from sugar, and a texture that doesn't get much thicker. Perfect for that smoothie style beer you're working on. Use plenty extra if planning to ferment this to dryness and plan on high loss if you're going to separate the pulp.	Post fermentation is best. Use more than you think if fermenting. Works well in any style.
	Coconut	8	15	23	30	62	≥93	20	40	≥62	Coconut and coconut cream are water + pureed coconut, this one having sugar added. The high levels of coconut fat in this product can cause some issues with processing, so keep this in mind. The fat will float to the top. It is best to use a bright tank after infusing with this fruit so as to leave as much of the fat behind as you can.	Great for IPAs, Stouts, and Porters.
	Coconut Cream	8	15	23	30	62	≥93	20	40	≥62	Same as coconut but with no added sugar. See above.	Great for IPAs, Stouts, and Porters.
	Guava	8	15	23	30	62	≥93	20	40	≥62	The guava is such a fantastic tropical fruit. A wonderful foundational fruit, perfect for blending with other tropicals. Can stand up well on its own, especially when blended into modern IPAs and its derivatives. The seeds can leave a bit of a gritty texture that will settle in the tank. High levels of pulp.	Sours, IPAs
	Kiwi	10	18.75	28.75	37.5	77.5	116.25	20	40	≥62	The kiwi is acidic and sweet, with a mild flavor and aroma. Great for use post-fermentation, but requires a heavy hand for adequate impact when fermenting. Best for using in a blend or post-fermentation addition.	Post fermentation is best.
	Lychee	8	15	23	30	62	≥93	20	40	≥62	Light in color and body, huge on flavor and aroma. A more rare tropical fruit, yet always a crowd pleaser. Highly versatile, great for post-ferm, blended into almost any beer style, and holds up well when fermented out dry. Very little color impact.	Works well in any style or use.
	Mango	8	15	23	30	62	≥93	20	40	≥62	A tropical classic! The mango is a great aromatic, but light on flavor when fermented. If planning to use in fermentation either blend with another tropical fruit or use a heavy hand. Wonderfully thick, rich, velvety texture that makes for great post-fermentation additions.	Great for post fermentation. If fermenting it works well in lighter lagers, IPAs, and sours.
	Mango & Passionfruit	8	15	23	30	62	≥93	20	40	≥62	The best of both tropical fruit worlds. The mango is aromatic with a light, understated flavor. The passionfruit being almost the exact opposite, with a moderate funky aroma but a strong acidic flavor, these fruits make a wonderful combination. Work great in any application.	Great for post fermentation. If fermenting it works well in lighter lagers, IPAs, and sours.
	Papaya	8	15	23	30	62	≥93	20	40	≥62	Like the mango, this fruit has a mild expression. Unlike the mango, even when used in post-fermentation the papaya still needs a bit of propping up. Use in conjunction with another tropical fruit to add depth and complexity.	Blend into any tropical fruit use.
	Passion Fruit	4	7.5	11.5	15	31	46.5	10	20	31	Bright, acidic, and wonderfully orange. This fruit is intense! High levels of citric acid mean this fruit can provide that punch you need in other flabbier fruits. Use less than you think with this one, as a little goes a long way. Great in almost any application. If using post-fermentation, a blend is recommended.	Great for any style that needs an acidic punch.
	Pineapple	8	15	23	30	62	≥93	20	40	≥62	The quintessential tropical fruit. The base for almost every punch and tropical fruit cocktail. Holds up on its own, plays well with others, and can be used in any situation.	Works well in any style or use.
	Pomegranate	8	15	23	30	62	≥93	20	40	≥62	The fruit that gives grenadine its flavor. Bright and punchy, this fruit adds wonderful color and aroma to most beers. Works best post-fermentation, but holds up nicely on its own. The acidity is high, but not aggressively so. This fruit blends wonderfully with berries.	Works well in any style or use. Could be overpowered in maltier beers.
	Ginger (pineapple, lemon, ginger)	1.5	3	5	10	20	31	5	10	15	Ginger provides a fresh, spicy, and earthy characteristic to beers. A great blending stock that can add depth to styles that benefit from some earthy kick, like a Belgian Dubbel or farmhouse ale, while also adding a flare of fun to most orchard fruits.	Farmhouse ales, Belgians, or IPAs
	Lemongrass (pineapple, lemon, lemongrass)	1.5	3	5	10	20	31	5	10	15	Lemongrass is a fun way to add some earthy depth when a punch of lemon-like acidity is required. Hop-forward beers work best with this product.	IPAs, Light lagers, hefeweizens, wits
Tropical Fruit Blend (Pineapple, Mango, Passion fruit, lime)	8	15	23	30	62	≥93	20	40	≥62	A tropical cocktail blend all ready to rock! Pineapple as the foundation and base, mango for some aromatic complexity and color, passionfruit for the acidic balance and punchy flavor, with a hint of lime tying everything together. Works wonderfully post-fermentation, or on its own as your very own fermented fruit beer cocktail.	Works well in any style or use.	

	Beer First Flavor (fermented)			Fruit First Flavor (fermented)			Post-fermentation fruit additions			Notes	Recommended Styles	
	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl			
Orchard Fruit	Apricot	10	20	31	40	77.5	≥115	23	50	≥75	Apricot is a delightful fruit, bright, moderately tart, and wonderfully orange in color. This fruit works well on its own, but can clash with other fruits. Works best with other orchard fruit, tropicals, and citrus. Use caution when blending with berries.	Works well in any style
	Blood Peach	10	20	31	40	77.5	≥115	23	50	≥75	Highly aromatic, lovely deep red color, and a nice blend of sweet and sour. A great fruit to use on its own for the splash of color and flavors it provides. Works well with cherry and plum.	Works well in any style but best in lighter styles to let the color shine
	Chestnut & Vanilla	2.5	5	7.75	10	19.375	28.75	5.75	12.5	18.75	Chestnut provides a nutty depth to this vanilla puree. Use in combination with almost any other puree for a depth and complexity. Not recommended for use on its own in beer.	Works best in malt forward beers. Brown ales, bocks, altbiers.
	Dark Red Plum	10	20	31	40	77.5	≥115	23	50	≥75	The plum is tart, sweet, and pulpy. Makes for a thick beer when used post fermentation. When used during fermentation, can lead to larger amounts of trub and loss if not stirred back in suspension before packaging. This is a great foundation fruit for blending with others but also works well on its own.	Works great in darker styles that normally push similar flavors. Belgian quads, Imperial stouts, etc.
	Fig	2.5	5	7.75	10	19.375	28.75	5.75	12.5	18.75	The fig is thick and sweet fruit. With most of the flavor coming from the sugar content, this fruit doesn't do well on its own if you're expecting an explicit "fig jam" flavor. Highly recommend blending this into another fruit for a "dark fruit" depth or complexity that the beer might otherwise be missing. Works well for punching up the "dark fruit" characters of darker beers without being explicitly a "fruit beer".	Use with caution in lighter styles. Works best in darker, maltier beer styles. Great for BA in modest amounts.
	Green Apple	8	16	24.8	32	62	92	18.4	40	60	Tart, tannic, and sweet. This fruit when used at high fruiting levels can be quite assertive, but it truly shines when used as a booster for other fruits. The green apple works to enhance generally fruitiness of beers without coming off as acetaldehyde. Plays well with almost any other fruit except citrus	Works well in most styles. IPAs might be the hardest to use this best as the acidic nature can clash with the bitterness
	Melon	10	20	31	40	77.5	≥115	23	50	≥75	The melon is a mild fruit and can be used in most lighter beer styles with good effect. Works wonderfully with fruited IPAs, playing nicely off modern hop characteristics.	IPAs, Pale Ales, Double IPAs! Lighter belgian styles too
	Mirabelle Plum	10	20	31	40	77.5	≥115	23	50	≥75	Bright and acidic, this special plum varietal is truly a treat. Light in color this fruit would work well in almost any beer style and is bright enough to stand up on its own.	Works well in any style or use
	Pear	10	20	31	40	77.5	≥115	23	50	≥75	Pears are light in flavor and aroma. These are the foundational fruit. There is no fruit that doesnt work with a pear. If using it as a foundational fruit, cut the recommended amount in half.	Works best in lighter beer styles.
	Rhubarb	5	10	15.5	20	38.75	57.5	11.5	25	37.5	Sharply acidic, strongly aromatic, this fruit is perfect for blending to help punch up "flabbier" fruits. The strawberry is a classic combination, but this works well with dark plum, peach, papaya, and mango.	Works best in styles that arent too bitter.
	Watermelon	10	20	31	40	77.5	≥115	23	50	≥75	The watermelon is high in sulfur containing compounds. When fermenting with this fruit, make sure to add extra yeast nutrient to help keep sulfur formation to a minimum. Requires good fermentation practices. We recommended using this post-fermentation for the best impact. Makes for a great milkshake IPA	Post-fermentation is ideal. Use caution when fermenting.
	White Peach	10	20	31	40	77.5	≥115	23	50	≥75	The white is more akin to biting into a fresh peach off the tree than it is to peach candy. More mild flavor, color, and impact. This fruit works best as an accent in beers or as a blend with other fruit	Works well in any style or use
	Yellow Peach	10	20	31	40	77.5	≥115	23	50	≥75	The classic peach. Bright yellow, candy like flavor, and moderate intensity. Use this fruit on its own or as an accent in almost any beer style.	Works well in any style or use

		Beer First Flavor (fermented)			Fruit First Flavor (fermented)			Post-fermentation fruit additions					
		Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl	Low Intensity, lbs/bbl	Moderate Intensity, lbs/bbl	High Intensity, lbs/bbl		Notes	Recommended Styles
Citrus Fruits	Bergamot	1.5	3	5	10	20	≥31	5	10	≥15		The iconic Earl Grey is flavored with bergamot. This is a great fruit if you want to get adventurous with your beers, or if you're looking to bring some citrus to that hard tea FMB.	Tea beers/FMBs/RTDs. IPAs
	Blood Orange	1.5	3	5	10	20	≥31	5	10	≥15		Blood Orange has gone from cult hit to widespread classic. Beautiful color, soft acidity, and a spritely orange flavor. Works well with the iconic Blood Orange IPA or for a nice twist on a Belgian Wit.	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.
	Kalamansi	1.5	3	5	10	20	≥31	5	10	≥15		The kalamansi is a what happens when you cross and orange with a lime and add a twist of grapefruit. Extremely unique but with flavors that are relateable. Works well in a mimosa style beer cocktail, or anywhere you would normally use lime, orange, or really any citrus!	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.
	Lemon	1.5	3	5	10	20	≥31	5	10	≥15		All lemon, no pith! Bright and acidic, without the pithy bitter finish. This lemon is nothing but fresh and bright. No worries about your beer tasting like pledge or lemon rind. Brighten up any beer style with this citrus.	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.
	Lime	1.5	3	5	10	20	≥31	5	10	≥15		The lime is a summertime favorite. Use in low amounts for a Mexican Lager with lime already added. Punch it up further in a gose for that lime+salt combo that works so well together. Or add it to your IPA to bring about even more citrus aromas. Blends extremely well with tropical fruits and berries.	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.
	Mandarin	1.5	3	5	10	20	≥31	5	10	≥15		The mandarin is a more mellow orange experience. Rich and full of complexity compared to the blood orange, use this citrus fruit when you want a bit more orange oomph in your beer.	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.
	Orange & Bitter Orange	1.5	3	5	10	20	≥31	5	10	≥15		The bitter orange is the orange of the Belgian wit style beer. By blending in the standard naval orange, it keeps the pithy bitterness from getting out of hand and allows this fruit to be used in any orange necessary situation. Blend this specific orange with lemon and lime for a three citrus treat.	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.
	Pink Grapefruit	1.5	3	5	10	20	≥31	5	10	≥15		The pink grapefruit is bright, acidic, and not too bitter. Works well in place of most other citrus fruits when looking for a unique spin on the standard citrus beer. Plays extremely well with RTDs and IPAs.	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.
	Yuzu	1.5	3	5	10	20	≥31	5	10	≥15		The current hipster fruit favorite, the yuzu is as fun to say as it is to brew with. Similar in flavor and aroma to grapefruit + mandarin, the Yuzu is sure to get your customers talking about its unique flavor.	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.
GI Single Origin	Corsican Clementine	1.5	3	5	10	20	≥31	5	10	≥15		Highly appreciated in pastry-making, the clementine provides its subtle taste, its lively color and its ability to mix well with many other fruits, as well as chocolate, aromatic plants and spices, such as ginger and vanilla. Have fun and get creative with this one!	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.
	Sicilian Blood Orange	1.5	3	5	10	20	≥31	5	10	≥15		Sicilian blood oranges, cultivated exclusively in the Piana di Catania and in some villages in the area of Enna and Siracusa, are unique in the world for their taste. This is what a blood orange turned up to 11 tastes like.	IPAs, Belgians, Hefeweizen, Lagers, Sours. Could work in almost any style.

Thank You!

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