CRAFT Beer & Brewing Magazine®

# BREWING INDUSTRY GUIDE // SPRING 2022

**HOPS INSIDER:** 2022 SUPPLY AND DEMAND, SENSORY LEXICON, AND THE END OF CASCADE?

**MALT PRICE HIKES:** WHAT YOU NEED TO KNOW

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**NEW REALITIES** OF DRAFT BEER

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CASE STUDY: URBAN ARTIFACT DOUBLES DOWN ON FRUIT \\\\ CLEAN KVEIK IN THE BREWHOUSE

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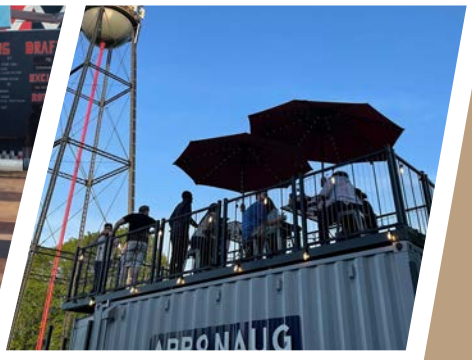

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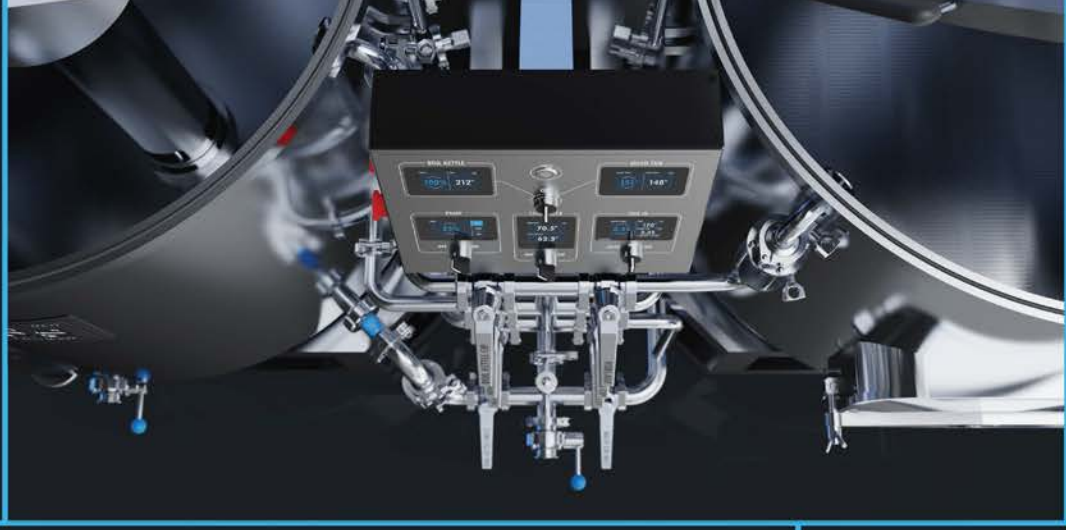

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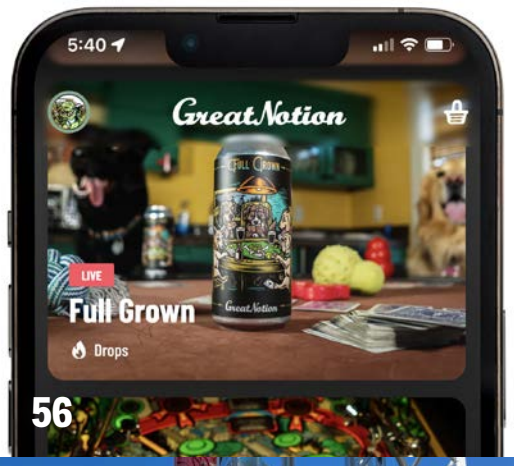



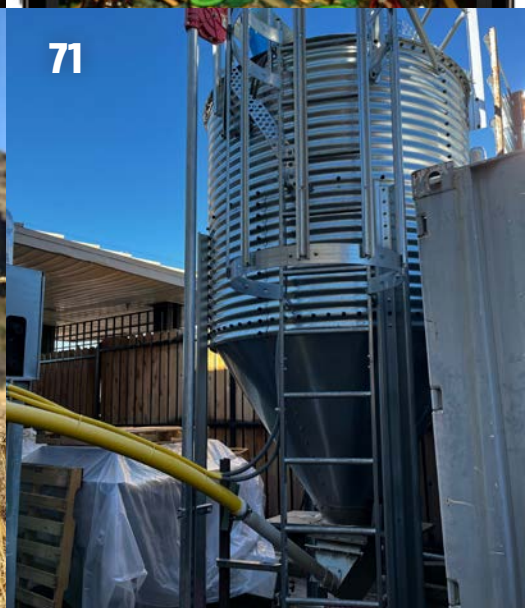


## DEPARTMENTS



## SELLING BEER



## MALT INSIDER

Beer & Brewing
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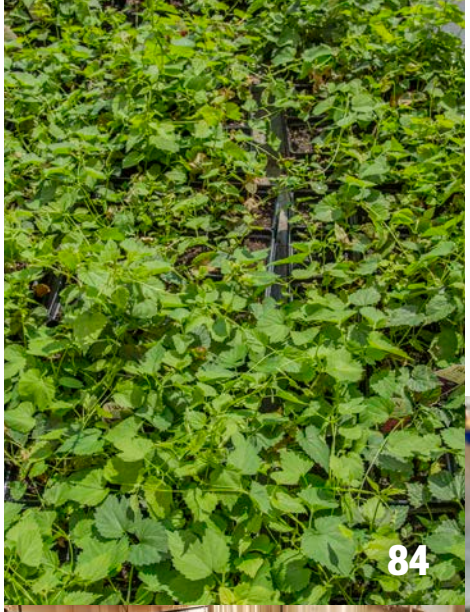





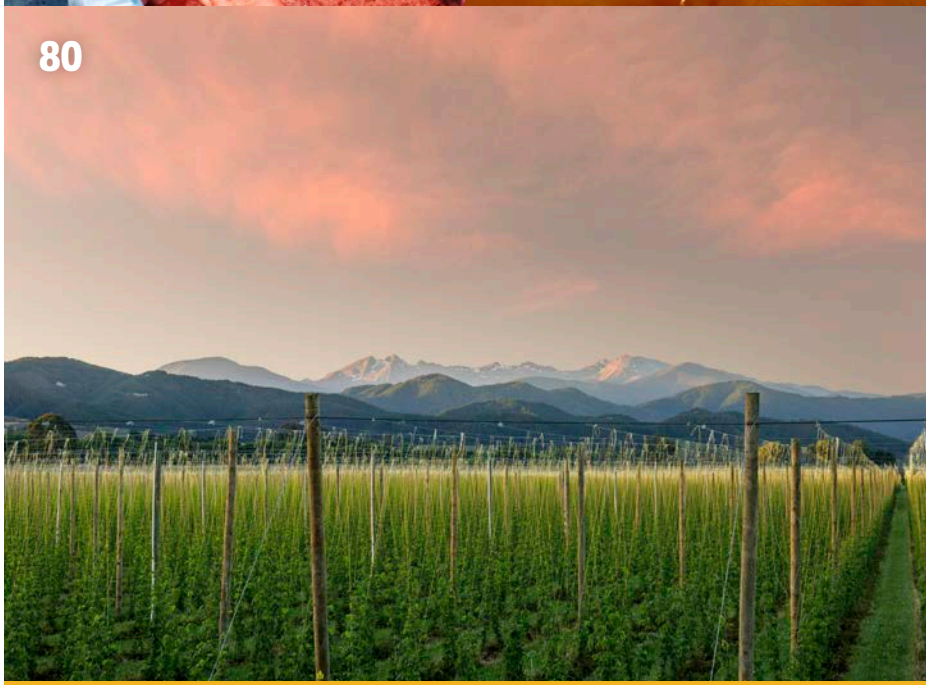


## UNDER THE MICROSCOPE



## HOPS INSIDER



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## CASE STUDIES



## MORE





***Craft Beer & Brewing Magazine® Brewing Industry Guide* Issue #18, March 2022**
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# // FROM THE EDITOR

**THE IDEA OF "CRAFT" MATTERS NOW AS MUCH AS IT EVER DID.** It's trendy to predict its demise; pundits have been poking holes in the idea of craft beer since it first gained currency. Plainly, it doesn't help that bad actors in the brewing world have shaken the trust that craft once elicited. Meanwhile, acquisitions of larger independent brewers have taken barrels out of the craft column, supporting a misleading narrative of plateau or decline.

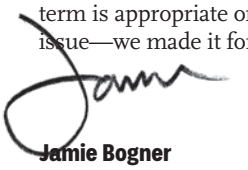
Still, I think the idea and hope of craft beer is worth saving and defending. It's not perfect. The definition is flexible. There are some who claim the category but don't live up to any sense of the broader ideals. Some stalwarts of those ideals have had to make difficult choices to protect employees and investors. It's messy, we're all far from agreeing on many issues, and we'll never get back to that plucky Rebel Alliance feel of fighting againt the Big Beer Empire. Yet the ideas of craft beer and of the community that has grown and formed around it—those are worth protecting.

Our beer-writer colleagues have a love-hate relationship with the subject of "craft." Many hours of conversation have lapsed, and pint after pint has been consumed, as we breathlessly argue the merits of clinging to this nomenclature. Is it problematic? Sure. Yet, despite the ways in which some brewers haven't lived up to the high standards it implies, and despite the historical weight it places on those in the category today, I still believe in the mission that drove those pioneers in the '80s and '90s to create brewing businesses that were hell-bent on upsetting the status quo.

Maintaining brewing traditions that the super-efficient world of corporate brewing would have us forget is important work. Focusing on high-quality, flavorful ingredients—and on close relationships with the producers who grow those ingredients—is important work. Celebrating forward-thinking innovation is important work. Elevating the labor of making—from that initial creative spark through sweat on the brewdeck and the rigor of packaging and cleaning—is important work. Authentically connecting artisan products with interested consumers is important work.

I'm not willing to give up the idea of "craft" and just call it beer, although there are plenty who think we should. We might not always live up to the promise of the term, and we may at times flounder under the weight of its expectations, but it still matters that we set an audacious goal. It matters that we dream big—that we maintain a hope and expectation for this industry against which we can judge ourselves. We will not always meet or exceed that standard, but it's better to strive and fall short than to never strive at all.

We prominently feature the word "craft" in our Craft Beer & Brewing brand because it matters. And whether you think the term is appropriate or a misnomer, we still hope you enjoy this issue—we made it for you.



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## UPCOMING *CRAFT BEER & BREWING MAGAZINE®* EVENTS AND APPEARANCES

*For timely updates, sign up for our newsletter at* ***brewingindustryguide.com.***

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**BETH DEMMON** is a San Diego–based beer journalist and recipient of the 2019 Diversity in Beer Writing grant from the North American Guild of Beer Writers. Her work has appeared in Good Beer Hunting, CraftBeer.com, VICE Munchies, and more.

**GREG ENGERT** is beverage director of the Neighborhood Restaurant Group in Washington, D.C., as well as cofounder and managing partner of restaurants Birch & Barley, Rustico, Sovereign, the brewery Bluejacket, and world-class beer bar ChurchKey. Recognition for his work as a beer professional includes a James Beard Award nomination, a "Sommelier of the Year" honor from *Food & Wine Magazine,* and a Starchefs Rising Star Award.

**DON TSE** is an internationally recognized beer writer and beer judge, working from his home base in the middle of North America's barley belt. He has sampled almost 24,000 different beers in the 20-plus years he has been working with beer, and he has admired the malt in all of them.

PHOTOS: COURTESY BEN KEENE; JESS SUWOROFF; COURTESY STAN HIERONYMUS; COURTESY BETH DEMMON; COURTESY NEIGHBORHOOD RESTAURANT GROUP; COURTESY DON TSE

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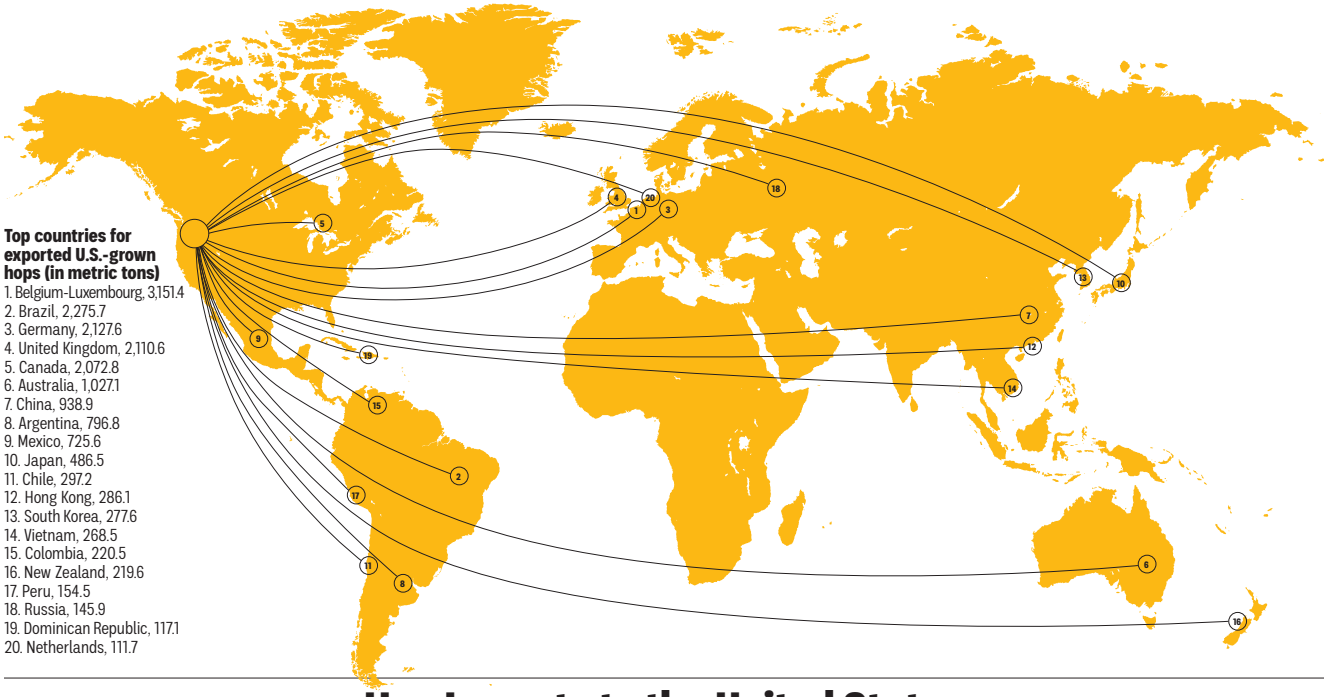
INFOGRAPHIC

# Hops In, Hops Out

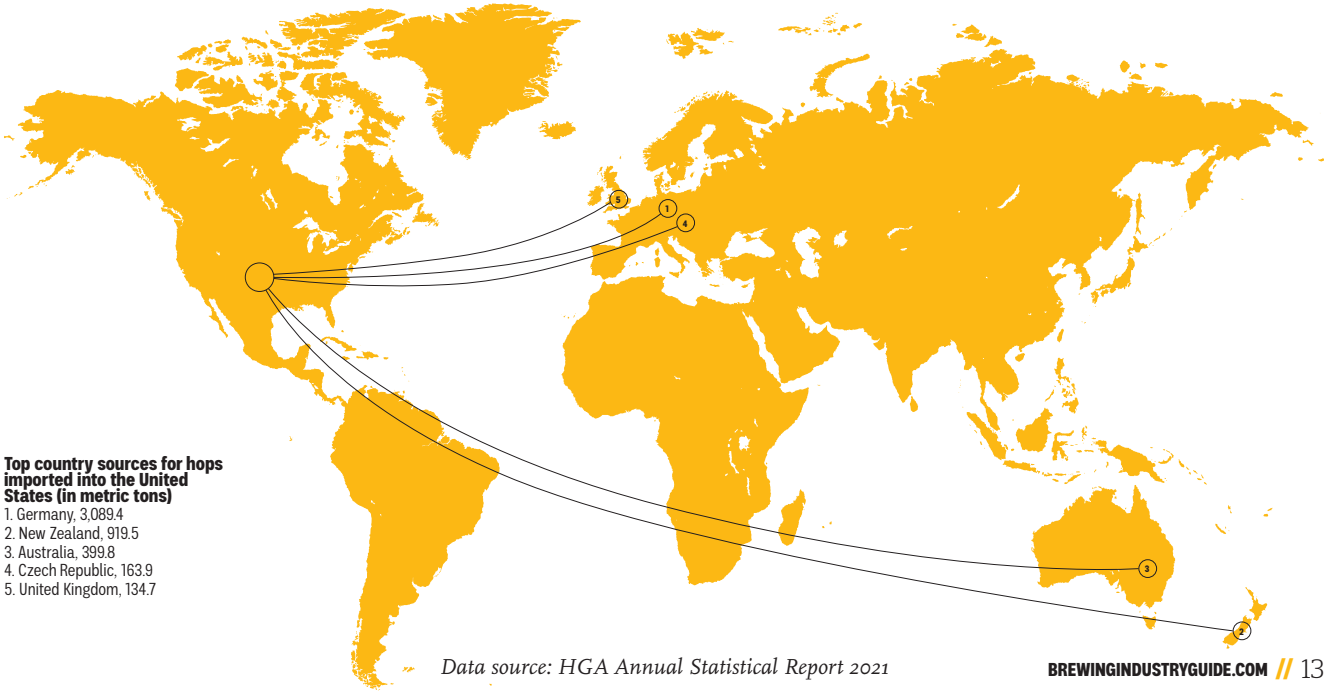
Hops are an international crop. Here, we've charted the inflows and outflows of the U.S. hop market, as suppliers ship to brewers around the world and as American brewers import mainly from Europe, Oceania, and Britain.

## Hop Exports from the United States



**Top countries for exported U.S.-grown hops (in metric tons)**
1. Belgium-Luxembourg, 3,151.4
2. Brazil, 2,275.7
3. Germany, 2,127.6
4. United Kingdom, 2,110.6
5. Canada, 2,072.8
6. Australia, 1,027.1
7. China, 938.9
8. Argentina, 796.8
9. Mexico, 725.6
10. Japan, 486.5
11. Chile, 297.2
12. Hong Kong, 286.1
13. South Korea, 277.6
14. Vietnam, 268.5
15. Colombia, 220.5
16. New Zealand, 219.6
17. Peru, 154.5
18. Russia, 145.9
19. Dominican Republic, 117.1
20. Netherlands, 111.7

## Hop Imports to the United States



**Top country sources for hops imported into the United States (in metric tons)**
1. Germany, 3,089.4
2. New Zealand, 919.5
3. Australia, 399.8
4. Czech Republic, 163.9
5. United Kingdom, 134.7

*Data source: HGA Annual Statistical Report 2021*

INDUSTRY NEWS & NOTES

# THE BEER TICKER

## BLACK IS BEAUTIFUL GETS ADDED REACH—VIA WALMART.

The retail giant says it will expand the availability of Black Is Beautiful beers made by San Antonio's Weathered Souls and 12 other breweries. The beers will be available in more than 600 Walmart locations in 21 states. Those brewers are expected to donate proceeds to the Harriet Baskerville Incubation program, which aims to support women and people of color in the brewing industry. Late last year, Weathered Souls cofounder and head brewer Marcus Baskerville—who launched the Black Is Beautiful initiative in 2020 to call attention to racial-justice issues—announced that he would open the brewery and incubator in 2022 in Charlotte, North Carolina. The program is named for his grandmother, who brewed during Prohibition.

## HEINEKEN WARNS OF HIGHER BEER PRICES.

Blaming rising costs and inflation, the world's second-largest beer company said prices would go up—but it did not say when or by how much. "These kind[s] of price increases and inflation, I think we have not seen in a generation," said CEO Dolf van den Brink, according to BBC News. He also said higher prices and living costs could lead to "softer beer consumption." Pandemic-era beer-buying habits sent Heineken sales up 17.4 percent in 2021, while the company's profits rose 80 percent.


PHOTO: COURTESY WEATHERED SOULS

## FEDS LOOK AT LEVELING BEER'S PLAYING FIELD.

The U.S. Treasury Department released a report, *Competition in the Markets for Beer, Wine, and Spirits,* with recommendations on how to improve competition in the alcohol industry. Bob Pease, president and CEO of the Brewers Association, released a statement that applauded the recommendations, many of which aligned with the BA's submitted comments. Among other comments, Pease praised "the report's focus on the federal Alcohol Administration Act's trade practice provisions and the continued need to combat practices like slotting fees and discriminatory conduct." He also said there was a lot of work to do at the state and federal levels, including scrutiny of state franchise laws, direct-to-consumer (DTC) sales access, preventing exclusionary practices, and the effects of small brewery acquisitions on distribution. On the subject of DTC shipping, the Treasury report says that it "offers distinct distribution opportunities for small producers, opportunities for innovation, and the possibility of serving small niches." Read the full Treasury report at home.treasury.gov/system/files/136/Competition-Report.pdf.

## THRIVE TO THRIVE AT CBC 2022.

As part of the Craft Brewers Conference in Minneapolis, the Brewers Association is organizing a one-day track of speakers, seminars, and other events focused on supporting diversity, equity, and inclusion in the brewing industry. The THRIVE Workshop, a "conference within a conference," is aimed at breweries of all sizes and includes networking opportunities and micro-consultations. Registration costs $15 for BA members and $20 for non-members. More info: craftbrewersconference.com.

## DEAL TO FACILITATE NZ HOPS IN NORTH AMERICA.

The hop supplier Charles Faram and New Zealand hop-grower cooperative NZ Hops recently announced a new partnership to supply hops to North American brewers. They said the deal means that brewers in Canada and the United States can better access sales and logistical support with "the benefits of a grower-direct supplier relationship." According to NZ Hops CEO Craig Orr, "This partnership creates a viable and sustainable feedback loop between the customer and the farms, as well as greatly simplified and responsive logistics." Charles Matt, president and CEO of Charles Faram, said the next step is to streamline the supply chain.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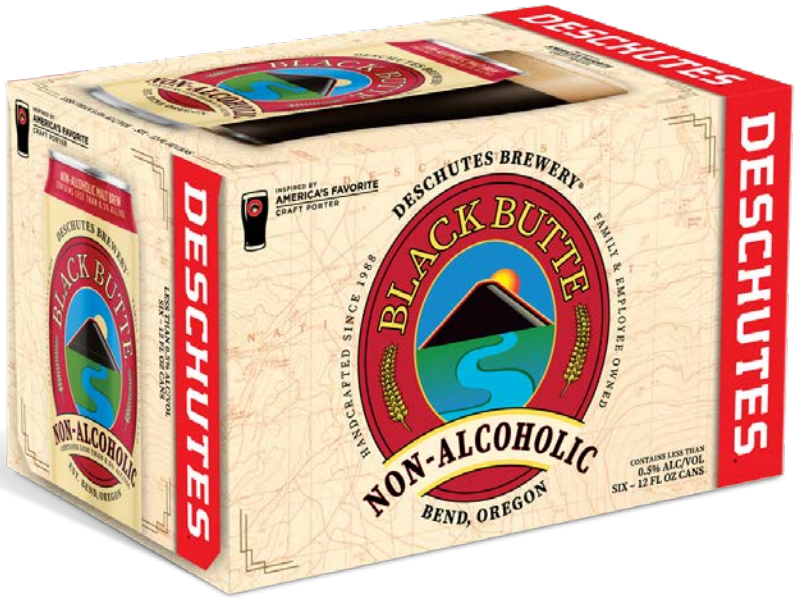


## AMID CAN CRUNCH, AMERICAN CANNING TO EXPAND CAPACITY.

Austin-based American Canning—which began as a mobile canning service in 2013 but has since expanded to packaging supply and manufacturing—announced that it was adding a new manufacturing plant and a second line for shrink-sleeve labels. The company said the new headquarters would triple its production capacity and be operational this spring.

## IRON HEART CANNING ADDS PROGRAM FOR MIXED-CULTURE CANNING.

The country's largest mobile canning company—with lines active in 26 states—said in January that it had launched a dedicated program for canning mixed-culture beverages, including those with *Brettanomyces* or other wild yeasts. Iron Heart said it would maintain a "clear line of separation" between the mixed-culture lines and its core canning service. The company debuted the mixed-culture program in 15 states and said it would expand according to demand.

## NEW CEO AT FOUNDERS.

Founders Brewing in Grand Rapids, Michigan, announced that Elton Andres Knight stepped into the role of CEO on February 1. Knight has worked for Mahou, Founders' parent company, since 2014, and has been the CEO at Avery Brewing—also a Mahou subsidiary—since 2019. The company said Knight will remain in his role at Avery. In January, the company announced that cofounder Mike Stevens would transition from his role as CEO to board member.

## DESCHUTES LAUNCHES NA BLACK BUTTE.

One of the country's legacy craft beers—and one of its top-selling porters—is getting a nonalcoholic (NA) version. Bend, Oregon's Deschutes announced in January that it would launch an NA version of Black Butte, calling it a "high-quality nonalcoholic beer that rivals the experience of a full-strength craft beer." The brewery has partnered with Sustainable Beverage Technologies to produce the beer using its BrewVo technology, calling it "a unique method that gently manages alcohol while maintaining flavor and aroma. The beer fully ferments to create the most mentally satisfying alcoholic beer–drinking experience."


## DOGFISH HEAD DROPS NEW WHISKEY, EXPANDS LIQUOR TO NY.

The Delaware brewer's distillery announced the release of a limited-edition whiskey, Alternate Takes Volume 3, finished in apple-brandy and Angry Orchard–cider barrels. The company also said its whiskey offerings, currently available in D.C., Delaware, Maryland, New Jersey, and Washington, would expand into New York this spring.

## ALASKA LOOKS AT EASING LAWS (SLIGHTLY) FOR TAPROOMS.

Currently, Alaskan businesses with a brewery retail license aren't allowed to sell beer later than 8 p.m., can't host live music or other entertainment, and aren't supposed to sell more than three 12 oz beers to any one person. However, the Alaska Legislature is considering several changes to the state's alcohol laws—including a provision that would extend those hours to 10 p.m. and allow up to four live music events per year. However, the per-person drink limit would remain at three. Local brewers say the proposed changes don't go far enough.

PHOTOS: COURTESY DESCHUTES; COURTESY ATHLETIC BREWING; COURTESY DOGFISH HEAD; COURTESY CINDERLANDS

## NA BEER TO BENEFIT DIVERSITY.


The nonprofit Beer Kulture and nonalcoholic specialist Athletic Brewing announced the release of a collaboration to mark Black History Month in February. The Soul Sour beer—with flavors of blueberry, lemon, and mango (BLM)—is available from Athletic's website (athleticbrewing.com) for shipping nationwide. The collaborators said that 100 percent of the proceeds would go toward fostering initiatives that support diversity, education, and inclusion in the beer community.

## BEHAVIORS ARE CHANGING, SAYS NEW NA DRINKS GROUP.

The Adult Nonalcoholic Beverage Association (ANBA)—just formed in December—aims to be the voice of nonalcoholic drinks manufacturers, including brewers of NA beer. The group says that NA beers and other NA drinks are seeing more sales as consumer behavior trends away from alcohol. Citing Nielsen, ANBA says that more than half of Americans are trying to drink less alcohol, while that rate increases to almost two-thirds of Gen Z and millennial drinkers.

## BREAD BEER TO FIGHT FOOD WASTE AND HUNGER.

Cinderlands Beer of Pittsburgh is teaming up with local Italian restaurant DiAnoia's Eatery on a beer made with extra

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bread from the kitchens. The idea behind the Con Pane hazy IPA is to raise awareness of food waste and help make the food industry more sustainable. Proceeds go to 412 Food Rescue, which works to get surplus food from Pittsburgh-area stores and restaurants into the hands of those who don't have enough to eat.


## REVOLUTION BREWING EXPANDS DISTRIBUTION TO IOWA AND MICHIGAN.

The 12-year-old Chicago-based brewery announced that it would partner with distributors Johnson Brothers of Iowa beginning in March and Minnesota's Artisan Beer Company beginning in April. Those will be the 10th and 11th states in Revolution's distribution footprint and the first two located west of the Mississippi River.

## HI-WIRE GROWS HIGHER.

Based in Asheville, North Carolina, Hi-Wire Brewing says it will expand its production brewery in Biltmore Village—bringing its potential capacity up to 40,000 barrels per year—while adding three new taprooms. The brewery says it produced 23,500 barrels in 2021.


## BA RECEIVES OSHA GRANT TO SUPPORT BREWER SAFETY.

For the second year in a row, the U.S. Labor Department's occupational safety agency awarded the Brewers Association a grant to support safety training and educational resources for independent brewers. The association says that the $132,664 grant will go toward updating safety-training materials and providing free training sessions on cleaning draft lines.

## CRAFT BEVERAGE WAREHOUSE ADDS DIGITAL CAN PRINTING.

Milwaukee-based packaging distributor CBW recently announced that it would expand while adding digital print-to-can capability. The move comes in a tight market for aluminum cans, making it more difficult and expensive for smaller breweries to get printed cans in the quantities they need. The company says it is doubling its footprint, hiring more staff, and planning to begin manufacturing in the second quarter of 2022.

## SIEBEL MARKS 150 YEARS WITH BEER AND EVENTS.

Founded in 1872, one of the country's most-respected brewing schools is celebrating a century and a half. The Chicago-based Siebel Institute of Technology says it is organizing several events, including happy hours and alumni gatherings, plus a collaboration beer to mark the anniversary. Watch the institute's Facebook and LinkedIn pages for information about upcoming events.

## COORS LIGHT DITCHES PLASTIC SIXER RINGS.

One of the country's most popular beer brands will stop using plastic six-pack rings later this year, opting instead for recyclable cardboard packaging. The plastic rings have been a fixture for decades; Molson Coors cites their risk to wildlife and contribution to ocean pollution for the change.

## MODERN TIMES CUTS BACK ON LOCATIONS.

The San Diego–based brewery announced in February that it would close four taprooms, citing fallout from the COVID pandemic and "global declines in the craft-beer industry." In a blog post, Modern Times said it would close its satellite taprooms in Los Angeles, Oakland, Santa Barbara, and Portland, Oregon.

Modern Times' downtown Los Angeles location closed February 18, along with locations in Santa Barbara and Oakland, California, and Portland, Oregon.

"Our Point Loma, North Park, Encinitas, and Anaheim locations will remain open," the brewery says, "and we will be turning our distribution and hospitality efforts back to Southern California and the Southwest as we do everything we can to step away from the opacity and unanchored optimism of the past and build a smaller, smarter, more focused, and more equitable company for the future. ... We've arrived at this current moment as the result of a combination of factors: four straight years of rapid, costly expansion followed by an unforeseen and financially devastating global health crisis and an industry-wide decline in sales. Taken together, these factors have stretched our finances and company culture to a point that is simply no longer sustainable."

As recently as 2020, Modern Times ranked 40th among craft breweries by volume, according to the Brewers Association. Less than two weeks after the taproom closure announcement, CEO Jennifer Briggs told Good Beer Hunting that the company would be willing to entertain offers from investors or potential buyers as the company reorganizes, facing debt that outpaced any revenues gained from expansion in recent years. Modern Times founder Jacob McKean stepped down from the CEO position in May 2021 amid multiple employee accounts of a toxic work environment and allegations that management was indifferent to harassment.

*Compiled by Joe Stange. Do you have news to share? Email jstange@beerandbrewing.com*

PHOTOS: COURTESY REVOLUTION; COURTESY MODERN TIMES; COURTESY HI-WIRE

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From left » Lukas Van den Abeele, Werner van Obberghen, and Michael Blancquaert

Q&A

# 3 Fonteinen's Werner van Obberghen

The business of supporting a creative brewing and blending enterprise is always delicate, but in the case of 3 Fonteinen, the weight of history and the expectations that come with brewing inside a storied tradition can create additional challenge. In this conversation, recorded for the Craft Beer & Brewing Podcast, Managing Director Werner van Obberghen muses about growing pains, the impact of COVID, the next generation, refocusing on craft malt, and going organic. **AS TOLD TO JAMIE BOGNER AND JOE STANGE**

**WO //** Our entity actually started at the end of the 1800s as a cafe in the village center of Beersel, which is a stone's throw away from Lot. It has gone through five different generations since then. And in the last, let's say 20 years or more, has actually built from a one-man blendery to a team of 20 today, where we have evolved from purely blending to brewing and blending. About 75 percent of the lambic that you see around us is actually brewed by 3 Fonteinen, and the other 25 percent, we still buy from different breweries, and we elevate it to lambic in our own barrels.

**CBB //** You "elevate" it?

**WO //** It's taken from the French word, élevage, coming from wine. The process of lambic brewing and the whole fermentation, maturation, and aging in a bottle is actually closer to winemaking than other types of beer making. And it bears a very historical approach to beer brewing. That makes lambic still very special in today's beer world. To give you an overview of what has happened since 2013, 3 Fonteinen was spread out in four different locations. We had the brewery in Beersel itself, we had a small barrel room under the brewery, we had a barrel room two streets from the brewery, and then two other barrel rooms, also with bottling equipment and labeling equipment in Halle, which is a 15-minute drive in normal hours. But, of course, brewers don't work normal hours; they work in the morning, they work in the evening. And that's the rush hour around Brussels. A normal 15-minute drive actually took about 45 minutes on average. At that time working there were four people at 3 Fonteinen, and one full-time employee was actually doing the logistics among the different locations. At that time, we were thinking about getting everything together to work more efficiently to have more options in terms of operations and so on.

**CBB //** For someone who comes from a business background, you also have a very firmly held philosophy about supporting that creative vision and creating an entire sustainable economy around this artisanal product.

**WO //** That's an interesting question, and it's not a short answer. Going back to those first days of thinking ahead and thinking about the future, there was

PHOTO: JAMIE BOGNER

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always one thing—there was a very big layer of gut feeling. And the gut feeling is just the energy you get from people sitting around the table. And in the beginning, that was Michaël [Blancquaert], Armand [Debelder], and myself.

**CBB //** This kind of generational thing is something that even American craft brewers are now facing. You have a generation of brewers who are retirement age, and how do you continue? You need to find someone to pass it on to, and the same thing has happened here—if you don't have a next generation within your own family that's interested in taking over that business. But if it's a business that is driven by passion, then you need to find someone with the passion to do that.

**WO //** Absolutely. Michaël was trained as an accountant, but those traits of being very structured are also very helpful in brewing because you have to follow some different steps, and you have to keep your head on the whole process. Armand not having children of his own, he was looking for the next generation— that's why he referred a lot to Michaël and myself as being the sons he never had.

The most difficult part of planning the future for a lambic brewery or blender is the complexity of having a balance within the barrel room. You need to have one-year, two-year, three-year barrels, and in the case of 3 Fonteinen, we have barrels of three, four, five, and six years. You need to plan that ahead if you want to buy new barrels, and you have to start to model the financial side of it to go to a bank for a loan, and so on. That was up to Michaël and myself to do.

**CBB //** You are spending a lot of money to make beer that you won't sell for several years. You also then need to predict demand several years out so that you are making the right amount of beer three years from now. And, of course, you can't plan for something like a global pandemic that happens in the midst of all of that.

**WO //** We don't have a linear process. We brew something just to put it away for a very long time. We brew and we blend with a very huge delay. We plan ahead, we join different experiences and expertise, then we decide, and we go. It took six years to come to that balance—we pre-invested quite some effort in terms of human capital. We hired an extra brewer, we hired people for the barrel room, before actually selling the very first bottle, and then COVID hit. That was the worst timing because we actually got to the new kind of balance at the end of 2019, a few months before COVID.

**CBB //** You built this new, more much more expensive facility, you filled it up with barrels and beer, more foeders, everything else in order to increase production and hopefully make enough beer to meet more of the demand for it worldwide. And then COVID hits.

**WO //** The initial plan has always been to go to 8,000 hectoliters (roughly 6,800 bbl) of barrel capacity to actually produce around 2,000–3,500 hectoliters (1,700–3,000 bbl) in bottles. It's more or less a rotation cycle of two and a half years. Between the brew and the actual usage of the lambic for fruit maturation or to blend it to a gueuze, every drop in a weighted-average approach is two and a half years before we use it in the barrel room. That's not including the bottle conditioning. It's a very long process.

It's the continuation of the process that Armand has always respected. With this new facility, we're doing the same thing only on another scale. Growing a business is one thing, but it's also important to keep in mind the values with which you do it. And that hasn't changed with 3 Fonteinen.

**CBB //** The craft malt idea has been growing in the world of craft beer. That's something that you have embraced deeply here. From an American perspective, when we think about lambic brewing, we think about the romantic idea of fruit and spontaneous fermentation. But grain is something that you have focused on deeply. Talk about the program that you have engaged in to more closely connect your lambic beer with the grain it's made from.

**WO //** That takes us back to 2017, a nice summer day outside when we were thinking about the very long term for 3 Fonteinen, and while we were discussing buying new barrels and trying more fruits, the next question popped up—"what about cereals?" That's where Armand put his fist on the table and said, "We have to go back to our own back garden."

Luckily, we are close to the bio talent. It took only a few phone calls to get in touch with some farmers. Very quickly, we were in touch with a botanist who was already multiplying very old varieties of landrace wheat. He pointed us to Lucas, who at that time was doing his thesis around agro-ecology. And from then on, everything happened—pun intended—spontaneously. When sitting together with farmers, you not only share the same passion, but you also feel their challenges, you feel their values. The beauty of it all is that while everyone says it's quite innovative, it's not. It's actually doing again what was once the standard. That's the expression of terroir—when talking about lambic, of course, you're talking about the air, the sun, the river. But we're forgetting about the soil, which is also very fruitful and very rich in these regions. It was just pure logic that we would do it because it's also an expression of the steadfast direction that 3 Fonteinen is going.

Our interpretation is that [lambic] should not be a standardized beer. It never has been, and it never should be. It's a natural beer, and you cannot control nature. It starts with the cereals. A lot of today's industrial grains are being cultivated for the very specific feature of efficiency in the brewing kettle. How much sugar do you get out of the grain? A lot of breweries today brew for efficiency. But our brewing installation is as inefficient as can be. Just to give you an idea, and I think the brewers among us will really like what I'm going to say, on a normal brew day we brew between 12° and 13° Plato [wort]; that's about the density of lambic, but in our spent grains, there's still 6° Plato left when it goes out. So the cattle of the farmer to whom we give it, they're very happy because there's still a lot of nutritional

**WHEN SITTING TOGETHER WITH FARMERS, YOU NOT ONLY SHARE THE SAME PASSION, BUT YOU ALSO FEEL THEIR CHALLENGES, YOU FEEL THEIR VALUES. THE BEAUTY OF IT ALL IS THAT WHILE EVERYONE SAYS IT'S QUITE INNOVATIVE, IT'S NOT. IT'S ACTUALLY DOING AGAIN WHAT WAS ONCE THE STANDARD. THAT'S THE EXPRESSION OF TERROIR—WHEN TALKING ABOUT LAMBIC, OF COURSE, YOU'RE TALKING ABOUT THE AIR, THE SUN, THE RIVER. BUT WE'RE FORGETTING ABOUT THE SOIL, WHICH IS ALSO VERY FRUITFUL AND VERY RICH IN THESE REGIONS. IT WAS JUST PURE LOGIC THAT WE WOULD DO IT.**

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material in the spent grains. But it's absolutely not efficient. And to also answer to your question about the agronomical model and the flavor impact. We are now working and researching on more than 50 different cereals spread over wheat and barley. But we actually started sometimes from only five or six grams [of seed].

It's a handful, and it takes about five to seven years before you have a volume that you can actually brew with. There are a lot of things that we're doing that we will only know the results of in so many years. And that's part of the effort. Meanwhile, we are learning as a whole group—the farmers are learning, we are learning, we're doing small tests. And that's the part of the adventure, I think. But we're documenting everything so that at least in a certain time, we can learn from it—we can see what we're going to continue or discontinue. Another interesting fact is that a lot of these grains were not found in Belgium, but a lot of grains were actually found in seed banks in the United States.

We test the different varieties first on the field to see whether their agronomic traits are good enough to grow in our region. If they're not, then we can delete them. If they do pass the test of five years, then we brew with them. And we try to first brew 100 percent with one variety and not mix them up, to see how they evolve in the beer.

We have a very interesting project going on here with the barrels behind me, where there's a PhD student looking at how these lambics evolve. The yeast and bacteria inside—are they different? Or do they behave differently? The only parameter that changes is the wheat. We have 60 percent of barley malt; that stays constant. Then we have 40 percent of wheat. So we have one red old landrace variety, one white landrace, and then one is just regular modern wheat for comparison. These results are extremely interesting because there are differences.

**CBB //** The wheat variety could impact the microbial development of the beer itself?

**WO //** We're also talking about organic cereals. So whether it's the cereal itself or on the grains themselves, there's already a life existing, and that can really change from one type to the other, or one variety or landrace to the other. That's also part of the study because there's already a lot of material existing on the ingredients. Look at natural wine—it's the same thing. There's already yeast and living material on the grape itself, and the grape skin is used in the whole fermentation.

**CBB //** Obviously this isn't a process that anyone would want to rush, but when do you think it would be possible for somebody to finally have a bottle in their hands of 3 Fonteinen Oude Gueuze that was made with these landrace grain varieties?

**WO //** The first full bottle of grown gueuze will be for next year, 2023. And then because we have started with the ambition of going fully, officially organic, that will be for 2024 or 2025.

*This interview has been edited for length and clarity.*

# BREWING OUR LEGACY

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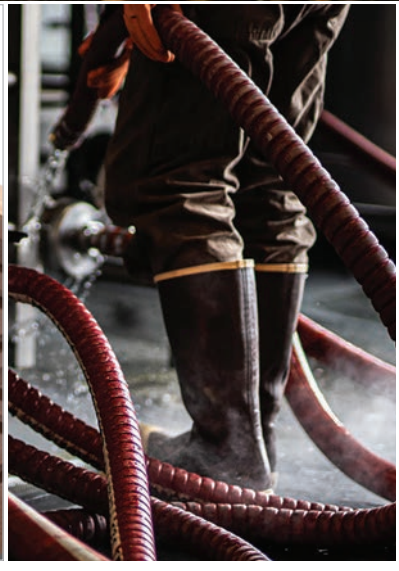

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BEHIND THE BAR

# Here Come the Hand Pumps! (No, Really.)

There are signs that American brewers are emerging from a relatively monotonous haze phase to re-embrace more choices via lagers, traditional styles—and even cask ales. **GREG ENGERT,** partner and beer director with the Neighborhood Restaurant Group, argues for their inevitability while offering his best advice on adding cask to your bar or taproom.

**BREWERIES AND BEER BARS DELIVER** more variety to the guest today than they have in years. While no one can declare the age of New England IPA over, the sheer number of pilsners, hoppy West Coast throwbacks, and traditional styles showing up at the haziest of taprooms tells us that something is afoot. Add the explosive popularity of side-pull taps, perfect for both developing and showcasing the textural possibilities of all manner of lager, and it's abundantly clear that brewers and guests alike are increasingly interested in flavor nuance and the kind of elevated service that can best express it.

So, it was just a matter of time before classic British beer styles and cask ales would begin to make their comeback. American brewers have been kegging and canning various takes on English bitters and mild ales with growing regularity since before the 2020 lockdown. While the packaged versions of these beers have remained viable throughout the pandemic, it took the relative return to normalcy—and on-premise drinking—to accelerate the interest in serving these low-ABV, dry, and oh-so-drinkable beers the way the beer gods have always intended: from cask. The mild, creamy, and 100 percent natural carbonation coupled with service at cellar temperature gets to the heart of the beer in a singular way. As the pint glass empties, aromas continually evolve while the rich, full-flavored brew spreads gently across the palate, showcasing the intriguing interplay of malt and hops. It's almost impossible to avoid ordering a second glass.

I've been serving and celebrating cask ale for almost 20 years. I've watched interest in it wax and wane, and I've seen the very nature of American cask ale alter on multiple occasions. Before your taprooms were churning out weekly line-inducing rarities in cans, cask ale was a way for brewpubs, bars, and restaurants to get the guests' attention—it showed that we were serious about beer and taking care of it.

As brewers' draft and bottle lineups expanded to answer the call for rotational newness, cask ale consumption declined—as did the quality of the cask beer itself. (Unfiltered, unpasteurized, and naturally carbonated, cask relies wholly on freshness for its charm.) Casks hung on as a way for brewers to spike their beers with one-off ingredients, to instantly create unique variants (often with fully carbonated beer as a base). Yet once small-batch releases of cans and kegs became de rigueur, this approach became obsolete.

A small cadre of brewers and publicans have hung on to it over the years, pushing to properly craft and pour traditional British-style beer from cask. It's exciting to see so many new breweries and bars now showing interest in this time-honored tradition, but success isn't guaranteed. At ChurchKey and our other bars, I have found it necessary to overhaul our

**BEFORE YOUR TAPROOMS WERE CHURNING OUT WEEKLY LINE-INDUCING RARITIES IN CANS, CASK ALE WAS A WAY FOR BREWPUBS, BARS, AND RESTAURANTS TO GET THE GUESTS' ATTENTION—IT SHOWED THAT WE WERE SERIOUS ABOUT BEER AND TAKING CARE OF IT.**

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approach to serving these wonderful beers over the years.

However, the time is certainly right for cask ale—as long as we do cask right this time.

## A PLAN FOR CASK SUCCESS

Less is more—that's the first lesson for cask ale in 2022. As brewers and bars consider developing cask programs, it's better to start small and go from there. The fewer cask options on hand, the more we can focus on moving beer that's as fresh as possible. It's better to pour through one cask rather than half of two, with the remainder being dumped because of spoilage. This goes for those looking to tap firkins (10.8 gallons) or—better yet—pins (5.4 gallons) on the bar for special events, as well as for those looking to build a full-time program by setting up a direct-draw beer engine.

### Price It to Move

Either way, I'd suggest setting a price that helps to ensure the beer moves swiftly; too often I've seen casks served in small pours for hefty prices.

That may seem counterintuitive, since cask beer isn't necessarily cheap: the labor for filling casks can increase its cost, while cask imports can cost more due to shipping and multitier markups. However, it's best to consistently serve these beers in larger pours—ideally, the 20-oz British imperial pint—to honor tradition and the sessionable nature of the style. Keeping the price lower (say, between $5–$8 per imperial pint, depending on your local market) also encourages the beer to move more quickly. I'd rather sell through a full firkin at a lower price point and slimmer margin than sell three-quarters of it at a better margin while dumping the final pours. Plus, we can always slightly increase the price of more popular styles to achieve a better blended cost percentage on average.

### Give It Time before Tapping

Over the years, I've decreased the number of casks on offer at any given location for freshness concerns, but there is an additional benefit: It allows us to better prepare the casks for service.

When designing a full-time cask program, I suggest making room in your walk-in or under-counter direct-draw cooler for upcoming casks to settle and vent before service. Where we used to have an under-counter direct-draw cooler that could hold three casks for service, we now serve two casks from that cooler; this leaves us a third space to properly settle and vent a new cask before tapping. Without this adjustment, we were too often moving the new cask into place just before service. This left the beer *overly* foamy and lacking in both clarity and developed flavors from the start.

### Cooler Specs

When shopping for under-counter direct-draw coolers, be sure that the temperature can be adjusted to 50–55°F (10–13°C)—the proper cellar temperature for cask service, though I tend to focus on the cooler end of this range to keep the beer brighter on the palate.

Also make sure the dimensions are right. While length will vary because of offerings, you'll need at least 18.5 inches (47 cm) in depth and 26 inches (66 cm) in height. If possible, make sure that the door openings equal 16.5 inches (42 cm) or more; some old-school firkins in the trade are just a bit wider than 16 inches (41 cm) and won't fit into many standard under-counter direct-draw coolers.

### More Tools of the Trade

When it comes time to load in those casks and prepare for service, make sure to use a **CaskWidge** (or similar) system along with a **cask breather.** Until a few years ago, I tapped casks horizontally on **stillage racks** and used **spiles** (small, porous wooden pegs) to vent and assist with beer flow for the duration of the cask. The spiles allow for proper aeration of the beer, which is important for initial flavor development and for carbonation levels. However, they also invite increasing oxidation that spoils the beer after just a few days. A CaskWidge allows us to pour the cask from the upright position; a flexible pipe lowered into the cask draws beer from below the surface; this prevents any surface oxidation from affecting the dispensed beer.

In addition to the tube that draws beer out of the cask, the CaskWidge system includes a tube for air flow. By tapping a new cask 24 hours before we serve it, but not attaching it to the beer engine quite yet for service, we can place a spile in the airflow tube that will allow the beer to vent for proper aeration and carbonation. Once the beer is ready to serve, the widge's quick disconnect kit allows us to attach the new cask, which is already set and vented, to the beer engine for service.

After a day or two, when the gas activity is tempered, flavors have developed, and the beer level is depleting, we can disconnect the spiled airflow tube and connect a different tube attached to the cask breather spigot. This brings low-pressure $CO_2$ (at 5 psi) to the cask, filling the headspace above the liquid and extending the life of the beer; the $CO_2$ keeps that headspace purged of oxygen yet isn't enough to re-carbonate the beer.

By using the CaskWidge and cask breather, we have been able to pour consistently delicious cask beer for up to a week rather than just a few days.

When it comes to **beer engines,** I prefer the quarter-pint model to the half-pint. The former dispenses a quarter-pint's worth of beer with each pull, rather than a half-pint, so there is less unrefrigerated beer left in the engine before dispense. I also employ **sparklers,** which are perforated plastic caps that attach to the end of the beer engine's dispense spouts. The holes in the sparkler aerate and agitate the beer as it's poured, creating a tight, creamy head that contributes so much to the textural enjoyment of the beer. For casks that show lively carbonation, I use sparklers with 1-millimeter holes; for those that could use a bit of a lift, sparklers with 0.6-millimeter holes are best.

A quick shout-out: For nearly 20 years, our go-to for this sort of gear has been UK Brewing Supplies (ukbrewing.com); owner Paul Pendyck has done as much as anyone for cask ale in the United States.

## A FRESH CHANCE

By properly considering the approach to preparing and serving cask ale, we have the opportunity to convert a new generation of beer drinkers. As interest in classic British beer styles and cask ale grows, it's imperative that we showcase the very best version of these beers.

If we get this right, budding enthusiasts won't understand why previous generations derided cask ale for being warm and flat or oxidized and sour. They'll only know it as a singularly remarkable way to enjoy the flavor nuance of well-made beer: creamy, rich, and smooth, beautifully balanced, and ever-evolving in the glass.

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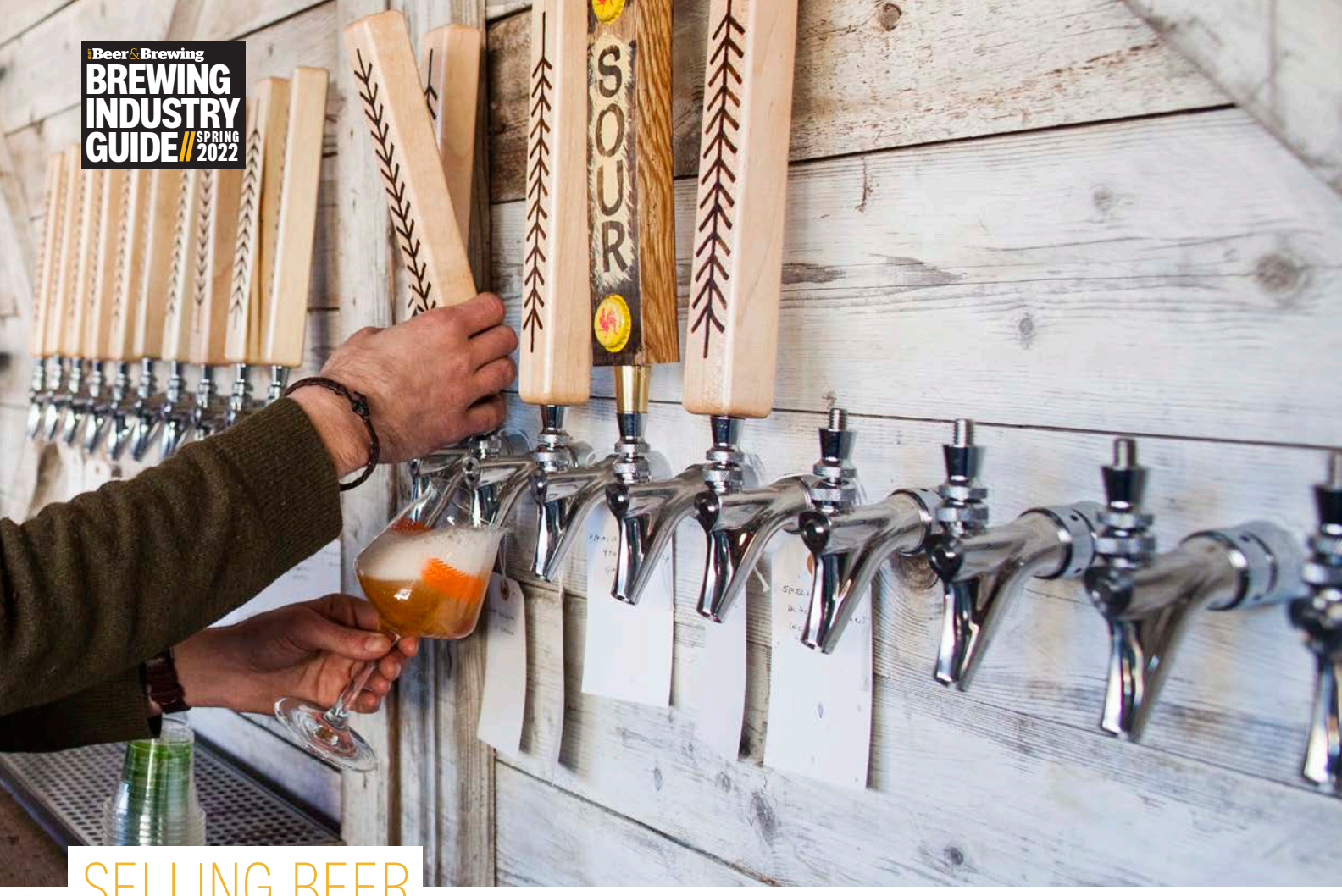


SELLING BEER

# Adjusting to the New Realities of Draft Beer

Given the stubborn uncertainty in on-premise hospitality, there are fewer taps flowing than there were two years ago. Yet those open draft lines represent opportunities for breweries willing to adjust and build relationships. **BY KATE BERNOT**

**DRAFT BEER IS BACK—FOR THE MOST PART.** Going into the end of 2021, U.S. draft-beer volumes were relatively even with where they were two years ago, before the pandemic. However, that doesn't mean retailers are thinking about their tap lists the same way.

Lingering pandemic concerns and the hard lessons of on-premise shutdowns have changed the way many operators are thinking about what they pour. Breweries may need to adjust which beers they're kegging—and the size of the kegs—to keep pace.

Here's what to know about the current landscape for draft beer.

## SAME BEER, FEWER LINES

One of the key realities for draft beer right now is that there are fewer lines pouring than there were in 2019—because there are fewer bars.

Lester Jones, chief economist for the National Beer Wholesalers Association (NBWA), says that there are fewer on-premise accounts per capita today than there have been in many years. In 2021, the United States had 151 bars and restaurants for every 100,000 people, down from a recent high of 164 in 2017. Those accounts are 77 percent independently owned currently, down from 80 percent independent ownership in 2008.

"There are absolutely more people and fewer places, so places that survived and managed to stay open through the pandemic are seeing more people come in," Jones said on December 2 as part of the Q3 Beer Industry Review presented by Fintech and the NBWA.

Draft beer also has declined slightly as a share of on-premise beer business last year: Draft was 51 percent of on-premise sales in mid-November 2021, compared to 54 percent during the same period in 2020. Cans, meanwhile, increased their share from 18 to 22 percent, despite the

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increasingly tight availability of aluminum cans.

Simultaneously, bars have more open tap lines that aren't attached to any kegs—they're simply not in use. Data from Draftline Technologies, a draft management and market analytics company, track the open draft lines at its clients' accounts. There were roughly 95,000 of those lines in November 2021, compared to about 45,000 in January 2019. Almost half of all accounts tracked by DraftLine have at least one open draft line.

## CONSTANT UNCERTAINTY

What's behind the open draft lines? The caution of bar owners.

With the Delta and Omicron variants' blow to on-premise business still fresh in their minds, many publicans are ordering kegs more conservatively, and they are not necessarily filling every draft line.

"There is constant uncertainty right now," says Damon Arredondo, a brewing consultant who runs Crafted KC Services, based in Kansas City, Missouri. "There's more focus [from bar owners] on intentionality around styles, around quantity, stuff like that. They're asking: Are the taps really moving?"

Pat Berger, owner of the Kaiser Tiger bar and beer garden in Chicago, says the pandemic led him to simplify aspects of his business, including beer buying. For a good chunk of 2020, Kaiser Tiger had just nine or 10 of its 24 taps hooked up and serving beer. That meant that kegs kicked more quickly and were full of fresher beer. Berger says he prioritized breweries with which he has strong relationships over fast-rotating handles and constant changes among breweries and beers. Customers, he says, liked the shift.

"We're rotating less," he says. "Now, if it ain't broke, I won't try to fix it. If a beer is doing well, and it's coming in fresh and it's high-quality and tasting good, then I'm just going to leave it on and build an audience for that beer," Berger says.

Lately, Kaiser Tiger is back to its full 24-tap line up. But because no one can predict what on-premise traffic will look like in two weeks or two months, Berger isn't taking chances on faddish beers or breweries with inconsistent track records on quality. He wants to know that any keg he puts on is going to taste great and sell through quickly. In 2021, he says, his top sellers were Pilsner Urquell and a house lager brewed for Kaiser Tiger by neighboring Great Central Brewing.

"I guess I've reprioritized what I think is important, and the latest, newest fad is not important to me," Berger says. "I'd like to see more of an emphasis on making better beer, rather than just making a new and different beer."

## STYLES AND SIXTELS

With unpredictable shifts in on-premise traffic, some breweries are hedging their bets by kegging beer styles with longer shelf lives, moving away from hazy IPAs toward lagers, wheat beers, and blonde ales.

Arredondo says this is beneficial because it gives breweries a longer window for selling through their kegs. It can also save on brewhouse labor if brewing and kegging shifts occur less frequently. Anecdotally, he says that he's seeing fewer hoppy beers on tap at accounts around Kansas City; a bar with 14 taps might have two fewer IPAs on draft now than it did before the pandemic.

He's also seeing demand from bar owners for sixtels over half-barrels—a preference that existed before the pandemic but has accelerated given uncertainty about on-premise traffic. Kegging into sixtels might make easier sales for a brewery, but margins are leaner when taking extra costs into account.

"Sixtels mean more kegs, more time, more cleaning," Arredondo says. "If a brewery doesn't have the inventory of sixth-barrels, it's more initial cost if they're purchasing. Annual keg loss—say it's about 12 percent of keg inventory. Then, if you're switching to sixth barrels, the cost of leasing them per fill or per purchase is higher."

## SEIZING THE OPPORTUNITY

Uncertainty has been just about the only certainty for brewers during the pandemic, and the wariness of retailers going into 2022 is just one more aspect of that. However, there is another way to look at those open draft lines. The NBWA's Jones says those lines represent chances for breweries to get their kegs on tap—if they can deliver the styles and sizes that retailers want.

"The reality is that there's this huge opportunity sitting out there for the U.S. beer industry, and it's evident in this data that we just aren't maximizing it," Jones said at the Fintech/NBWA presentation. "I'm not finger-pointing here because I'm sure that there are retailers who are reluctant to put more beer on draft because they know what happened last time. But at the same time, we have to figure out a way to move draft forward, especially when we find ourselves in this can crunch."

At the Kaiser Tiger, Berger agrees. He says current conditions benefit breweries that focus on the fundamentals: quality beer and the development of ongoing relationships with local bars. He is not necessarily enchanted by IPAs triple-dry-hopped with the newest experimental hop or stouts aged in the fanciest barrels.

"People bring me their beer, and if I like it, I pour it," Berger says. "If you put on something really delicious and drinkable, the populace will like it and order more of it."


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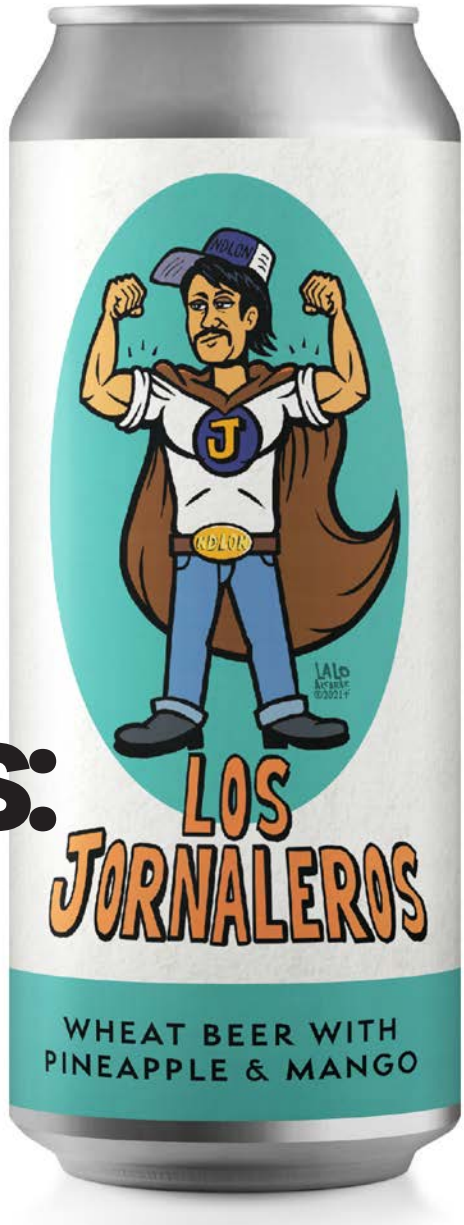


BUSINESS PRINCIPLES

# Beer Advocates: How Breweries Can Navigate Social Issues

Like it or not, social and political issues are becoming impossible for breweries and other businesses to avoid. Here is concrete advice on knowing when and how to get involved—and on how to choose your battles. **BY KATE BERNOT**

**THE CONVENTIONAL WISDOM** against mixing business with politics no longer applies—or, at least, not in the way it once did. Heightened political partisanship, greater attention to social justice, and social media all have changed the calculus on how and when small businesses should take stances on issues of the day.

In a 2020 report from Kantar Consulting titled "Igniting Purpose-Led Growth," almost two-thirds of millennial and Gen Z consumers say they prefer brands that express a point of view or stand for something. It also translates to the bottom line: Companies recognized for a high commitment to purpose—think Nike and its Colin Kaepernick ads—have seen their brand value grow at more than twice the rate of others, Kantar reports.

"The previously held taboo of crossing commercialism with politics may be well gone," *Harvard Business Review* declared in 2020.

Understandably, this makes some breweries leery—especially small breweries without paid communications teams to fine-tune their press releases and Facebook posts on sensitive issues. However, there are upsides to being a small, local company when it comes to weighing in on political or social topics.

"They know the values of their community and the concerns it might have about what's happening locally," says Brayden King, a professor of management and organizations at Northwestern University's Kellogg School of Management. "That's a way of saying they have their ears to the ground in a much better way than a large company would. If it's done well, it's a way to create more connection with the community."

King emphasizes that small breweries don't need to weigh in on every controversy, but they should identify which issues are important to them and to their customers.

"If you're a smaller organization, maybe this is the opportunity to sit back and reflect on, 'What are our values? We say we're community-based, but what does that mean?'" King says. "All of these craft breweries, part of their identity is that they're community-based businesses. So taking on a national agenda, that's fine, but it'll have far less of an impact and be less aligned with your identity."

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## ADAM FETCHER'S 6 KEY COMPONENTS OF ADVOCACY FOR BREWERIES

Fetcher, at New Belgium, shares this advice for businesses of any size.

**Establish and communicate your core values.** These are the big-picture principles your brewery stands for.

**Get your own house in order.** Make sure you're operating your brewery in line with those values, whether it's sustainable practices; fair pay and benefits; diversity, equity, and inclusion (DEI) efforts; or others.

**Pick a lane.** Choose an issue area that ties directly to your core values, the reason you're in business, and the community you serve.

**Shut up and listen.** When building relationships with frontline advocacy organizations working on the issue you seek to support, adopt a posture of listening and learning to understand their work, their priorities, and how they think your business can best add value to the movement they lead.

**Put skin in the game.** For-profit businesses have a responsibility to provide financial support to organizations on the front lines before getting vocal on the fights to which they've given their blood, sweat, and tears. Ultimately, cash grants that can be used for whatever these groups deem a priority are the highest-value support a business can provide.

**Amplify, amplify, amplify.** One of the most valuable tools your brewery can offer is the ability to reach thousands of people, via email, social media, taproom communications, etc., and mobilize them to join the movement for change. Use these channels to provide a megaphone for the frontline groups you support by amplifying their stories, key messages, and calls to action.

**"SPEAK TO WHAT YOU'RE ADVOCATING FOR—YOUR VISION FOR POSITIVE CHANGE, EMBODIED IN THE INSPIRING FRONTLINE COMMUNITY GROUPS YOU SUPPORT—INSTEAD OF WHAT OR WHO YOU OPPOSE," FETCHER SAYS. "THIS PROVIDES A WAY TO INVITE EVERYONE TO THE TABLE, VERSUS IMMEDIATELY ALIENATING THOSE [WHO] DISAGREE."**

Before your brewery takes to Facebook with a 2,000-word screed, though, here's guidance for framing and articulating your message.

### BE RELEVANT

A topic that has no obvious connection to a brewery's community is likely to confuse or anger people rather than attract them.

Even if a topic is important to ownership, it's more important that it resonates with their customers. Sprout Social's 2017 survey, "Championing Change in the Age of Social Media," found that "brands are most credible when an issue directly impacts their customers (47 percent), employees (40 percent), and business operations (31 percent)."

For Ray Ricky Rivera, founder of the Norwalk Brew House brand in the Los Angeles suburb of Norwalk, that means championing and partnering with other Latino-owned small businesses. Rivera is Mexican-American while many of his family, friends, customers, and homebrewers in the community are also Latin American. "I'm coming from the lens of a marginalized person, so usually whatever social issue I take a stand on is not new to me—it's what I've always seen," he says. "The difference now is I've got a beer brand. These things that I focus on are just things that I deal with and [that] I see people I know are dealing with. So it's a natural move for me."


Norwalk Brew House has, for example, donated a portion of sales from a beer called Los Vendors—brewed at Brewjeria Company in nearby Pico Rivera—to an emergency fund for undocumented street vendors during the pandemic. Can art, designed by renowned (and outspoken) L.A.-based artist Lalo Alcaraz, reads, "Legalize street vendors."

For brewery operators who are nervous about taking the leap, positivity can be a useful lens through which to view advocacy. It's not about "taking sides"; it's about promoting a cause you believe in, says Adam Fetcher, who joined New Belgium as director of communications and public relations after leading global PR for Patagonia and working as deputy national press secretary for President Obama's 2012 re-election campaign.

"Speak to what you're advocating for—your vision for positive change, embodied in the inspiring frontline community groups you support—instead of what or who you oppose," Fetcher says. "This provides a way to invite everyone to the table, versus immediately alienating those [who] disagree."

### DON'T TALK ABOUT IT. BE ABOUT IT.

Rivera says the challenge for him is not to deal with criticism of his brewing and advocacy projects—he hasn't really received any—but to ensure that Norwalk Brew House puts its money and resources behind the issues he cares about.

"It's so easy for brands to take to social media and make posts and do retweets and say that they're here to be supportive and that they want to help, but it takes actual action," he says. "You have to put in the work; you can't just post on Instagram."

The key, Fetcher says, is consistency and focus. "Your brewery can establish a clear set of core values and then take action to help solve critical issues aligned with those values, without ever stepping into the toxic realm of partisanship," Fetcher says in an email. "If you say your business cares about equal rights, but parts of your community are suffering unjustly (and they are), then you need to be doing your

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part to provide tangible support for real-life solutions."

King, the Northwestern professor, also emphasizes that point: "Before you step out to make an external statement about 'this is the way the world should be,' it's important for organizations and leaders to take a step back and say: 'What are we doing inside our organization to embrace these values we say we have?'"

This can be particularly tricky for breweries when it comes to issues of gender, race, ethnicity, and sexual expression because the vast majority of breweries are owned by straight white men. Calls for greater diversity resonate in a more authentic way when there are employees from marginalized groups within the company shaping those messages.

"The best way to improve your culture or your hiring practices is to bring in your critics, if they exist," King says. "If you have people saying, 'You're doing it wrong,' then include them at the table. That's an excellent, positive consequence of increasing diversity in organizations: You'll identify problems you didn't know you had."

## BE JUDICIOUS.

Small breweries don't have the resources to fight every battle, so it's important that they identify the ones most salient to their community. Even then, people don't expect a small business to look like a political action committee or behave like a nonprofit.

Sprout Social's survey found that customers "do have a point of saturation, even when brands are supporting the causes they care about." Sixty-three percent of respondents say a company's social media posts should be about political or social issues only 10 percent of the time or less, with just 1 to 5 percent being the sweet spot.

Some breweries may decide that certain issues are off-limits, even if they're important to ownership. This has been weighing on the mind of Nicki Werner, cofounder of Jefferson Beer Supply, a brewery that just opened in January.

Werner and the brewery's other founders are further left politically than the vast majority of residents in their town (population: 626). Two-thirds of the county voted for Donald Trump in 2020. So, while they hope to "make the culture we want to be a part of," they're doing that primarily through their business operations. The cofounders want the brewery to operate under an employee stock ownership program (ESOP) within five years. Current company policy says that no employee can earn more than three times what the lowest-paid employee does.

Werner says the founders know there will be limitations on which social or political issues the business can safely take a stand on. To stay afloat, build a following, and be part of the community, the brewery will need to be a place where all of Jefferson's residents feel welcomed.

"I think there are going to be a lot of hard decisions, but beer has already helped us overcome some of [the] differences between what [my] or my family's values or political stances might be and some of the people around us," Werner says. "I think people definitely think we're weirdos, which is my nice way of putting some of our political clashes. But now that we're doing this cool beer thing, they don't care as much."

## LOOK FOR MENTORS

One tactic that's helped Werner navigate these tricky waters is looking to other breweries for guidance. Werner cites the Fair State Brewing Cooperative in Minneapolis and Lady Justice Brewing in Denver as examples of how Jefferson Beer Supply would eventually like to run its business.

"Minneapolis is totally its own [political environment], but in other ways, it's the Midwest," Werner says. "Fair State is run as a co-op. There are so many things about their business we want to be." Werner says she follows their social media pages to see how they react to various issues.

"I'm constantly following and looking at them, their paths to growth, and how they can be successful in maintaining their values and growing a business."

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BEER MARKETING

# Going Big: Unlocking the Sales Potential of Double and Triple IPAs

Sales of imperial IPAs are outpacing sales of their standard-strength counterparts. Yet breweries need to find the right packaging mix, price point, recipe, and marketing to keep margins in line. **BY KATE BERNOT**

**IPAS HAVE LONG BEEN CRAFT** beer's crown jewel, both in terms of sales and drinkers' enthusiasm. However, lately, higher-strength IPAs are quietly taking on an outsized role within the category, outpacing the growth of American IPAs and hazy IPAs in Nielsen-tracked chain retail over the past half year.

Of the 48 style categories that Nielsen tracks within craft beer, just six—including imperial IPA—saw positive year-over-year growth in the 26-week period ending December 4. Imperial IPAs (which include those labeled double, triple, or imperial) grew 6 percent during that half-year period. IPAs overall were down 13 percent, while hazy IPAs were up just 2 percent. Overall, as the pandemic continues to play havoc with draft beer and shopping habits—and the biggest breweries still dominate grocery shelves—craft was down 10 percent.

For many breweries, double, and even triple, IPAs are exceeding sales expectations and connecting with drinkers, who equate them with intense flavor and bang-for-the-buck value. Yet these beers are also more expensive to produce, requiring high volumes of malt and hops—inputs that have become even more costly as supply-chain woes stretch into the new year. Making the right margins requires a dialed-in packaging mix, marketing message, recipe, and pricing strategy.

Here's how breweries have put those together to unlock big sales gains.

## RIGHT PACKAGE, RIGHT PRICE

While Triple Sunshine Triple IPA proved to be wildly popular during its first release in distribution this past November and December, Sean Lawson, founder of Lawson's Finest Liquids in Vermont, says it's "not an inexpensive beer to make."

Distributors asked for more of the special release, but Lawson's had maxed out its planned production for Triple Sunshine. At 10.5 percent ABV, the beer is a dialed-up version of the brewery's top taproom-only seller, Double Sunshine Double IPA, requiring even more malt and more pricey hops.

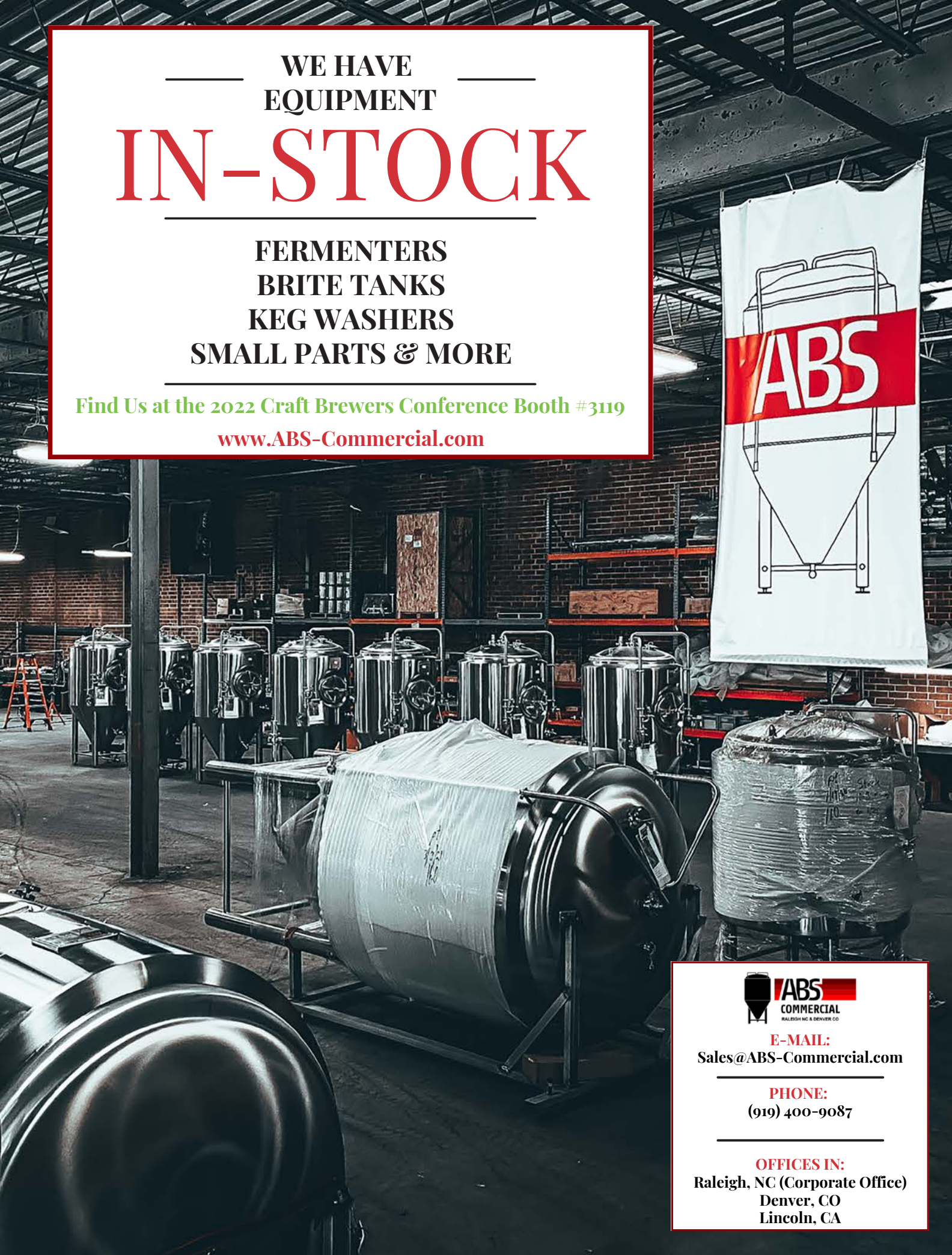
Based on those costs—and the double-digit ABV—Triple Sunshine is the rare Lawson's beer that's packaged in 12 oz cans rather than 16 oz cans. (The other is Lawson's 10.1 percent Fayston Maple Imperial Stout.) Despite the smaller size, the four-pack of Triple Sunshine retails for $16.99 to $17.99, compared to $14.99 to $15.99 per four-pack of Sip of Sunshine IPA.

"That package really does make the costs work out just fine," Lawson says. "The margin is good on it because it comes in that smaller format."

Packaging mix also has proven critical for Big Ballard Imperial IPA from Redhook, owned by AB InBev. The beer's Nielsen-tracked sales increased 27 percent in the 52-week period ending December 4. Redhook brand manager Jason Dodson says the brewery has been so pleased with those sales that it's designated Big Ballard as the brewery's new flagship, "front and center of the Redhook brand."

Part of that success has been what is, for Redhook, a nontraditional package mix, including 18-packs of 12 oz cans that (fortuitously) rolled out in early 2020, just before the pandemic. They were ready when shoppers hit supermarkets looking for larger packaging sizes. Redhook also packages Big Ballard in 4-packs of 16 oz cans priced in line with other Redhook offerings, at $6.99 to $7.99—a very low price for an imperial IPA in the Pacific

PHOTO: JAMIE BOGNER

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Northwest, and not one with which many independent breweries can compete.

The 4-pack of 16 oz cans has three advantages for Redhook. First, it's eight ounces less beer than a sixer of 12 oz cans, though it's priced comparably to six-packs on the shelf. Second, it's not competing with other brands for six-pack chain retail shelf placements, which are increasingly hard to get. Third, Redhook has found 16 oz cans easier to source than 12 oz cans lately.

"We started with 16 oz cans in the independent stores and convenience stores, but actually we're getting a lot of play with them now in chains," Dodson says. "It allows us to play at a lower price point."

When Redhook launched its first extension for Big Ballard this past fall, Hazy Big Ballard, it was the first time the brewery didn't even talk about 12 oz cans.

The takeaway for breweries of any size looking to accelerate imperial IPA sales isn't so much that 12 oz cans are better than 16 oz cans—or 19.2 oz cans, for that matter. It's that thinking strategically about margins, MSRP, and the competitive landscape can yield advantages.

## RECIPE MAGIC

Hops, of course, are what drives up costs to produce these brawny imperial IPAs. Phil Palmisano, CANarchy Craft Brewery Collective's director of sales for the Southeast, admits that the price and quantity of Citra, Azacca, El Dorado, and Mandarina Bavaria hops in Florida Man Double IPA are softened by CANarchy's scale. (One of the fastest-growing beer companies in the United States in recent years, the company is now set to be acquired by Monster Beverage—see "Monster to Gobble Up CANarchy," brewingindustryguide.com.)

In terms of margins, Palmisano says, "Florida Man is not as easy as some of the other beers are because when you're dealing with so many ingredients, specifically hops, there's a volume play. You need to make sure you're hitting a certain amount of volume to get that break-even."

But Florida Man has exceeded initial projections—especially when COVID meant it didn't get a proper launch in March 2020—to become Cigar City's No. 2 beer behind flagship Jai Alai IPA. For smaller breweries that can't bank on those multistate sales volumes, finding ways to work with less-expensive hops can still help the margins.

At Redhook, Big Ballard uses classic hop varieties such as Chinook, Cascade, and Centennial, updated with Mosaic and HBC 431. Its spinoff, Hazy Big Ballard, uses Sabro, El Dorado, BRU-1, and Cascade.

**DRINKERS ARE GRAVITATING TO THE EXTREMES OF BOTH ENDS OF THE ALCOHOL SPECTRUM, HIGH ABV AND LOW ABV. AT CANARCHY, PALMISANO SAYS THOSE TWO POLES ARE WHAT DISTRIBUTORS AND RETAILERS ARE LOOKING FOR WHEN IT COMES TO SPRING RESETS, TOO. AT THIS YEAR'S ANNUAL BRAND-PLANNING MEETINGS, HE SAYS, "THEY'RE ASKING, 'WHAT NONALCOHOLIC BEERS DO YOU HAVE? AND DO YOU HAVE ANYTHING OVER 9 [PERCENT]?'"**

"People are kind of like, 'Eh, Cascade is such an old hop,' but we have great pricing and availability on that," Dodson says. "Our brewers are super-familiar with that hop, so they can really get the most out of it. Things like that really help us play in the imperial space when they are very expensive to produce."

These classic hop varieties also have the effect of delivering a flavor profile that's in the comfort zone for many mainstream Pacific Northwest beer drinkers. Dodson says that internal market research showed Redhook's top three consumer segments are trade workers (e.g., those in construction or plumbing), freelancers, and parents—people who don't have a lot of time and energy to spend hunting down the newest, trendiest beers.

"How can we take this style—we're not first-to-market with it—but take what's working and tailor it to being really accessible to all beer drinkers and bringing it down to a price point that's really competitive?" Dodson asks. "What hops can we use, what processes can we use to get the flavor result we need?"

A bit of creativity when it comes to hops can go a long way toward improving the margins on imperial IPAs. Paying attention to hop blends and procedural brewing steps, such as centrifuging, can increase the return on investment.

## MARKETING MIGHT

Once New Belgium Voodoo Ranger Imperial IPA took off—to become the top selling IPA, period, in the United States—it provided proof of concept that high-octane IPAs could reach a national audience. (See also: Sierra Nevada's Big Little Thing.)

What separates these beers from their IPA brethren is, for most consumers, their elevated ABV. For some independent brewers, that may be an uncomfortable truth: Craft historically worked hard to pioneer the concept of refined enjoyment, not overindulgence. But breweries are now realizing that drinkers are gravitating to the extremes of both ends of the alcohol spectrum, high ABV and low ABV.

At CANarchy, Palmisano says those two poles are what distributors and retailers are looking for when it comes to Spring resets, too. At this year's annual brand-planning meetings, he says, "they're asking, 'What nonalcoholic beers do you have? And do you have anything over 9 [percent]?'"

In Vermont, Lawson says that the distinction is that breweries can charge a premium for the higher-ABV end of the spectrum. He adds that many drinkers *do* see the value—that bang for the buck—in stronger beers, even within one brewery's portfolio.

However, how much to lean into advertising the ABV is tricky. It's part of the value proposition to drinkers, but it can also run counter to responsible-drinking messages—especially when imperial IPAs often come in 16 oz, or even 19.2 oz, cans.

Perhaps no beer has to toe this line more carefully than Florida Man, whose name is a nod to the law-breaking, alligator-wrestling, nightly news staple that is "Florida Man." Cigar City plans to launch 19.2 oz cans of Florida Man in February.

"You never want to advertise something like, 'Hey, drink so many of these that you could be Florida Man,'" Palmisano says. "It's a fine line within craft beer in general when you're dealing with higher-octane beer specifically, where an introductory craft drinker is having a double IPA or triple IPA for the first time. It's about explaining to them that this is like drinking four or five 'normal beers.' Tell them to enjoy and savor the flavor; it's not really made for crushing."

Yet it's undeniable that both the beer's name and ABV have been critical to its success.

"The excitement and humor that the brand has built into it is starkly different from the seriousness of Jai Alai," Palmisano says. "So many people have pulled out their phones to show me their favorite Florida Man headline."

The delicate task for breweries marketing their imperial IPAs is to ensure customers are aware of the elevated ABV, but in a way that promotes responsible consumption and fun—not overindulgence.

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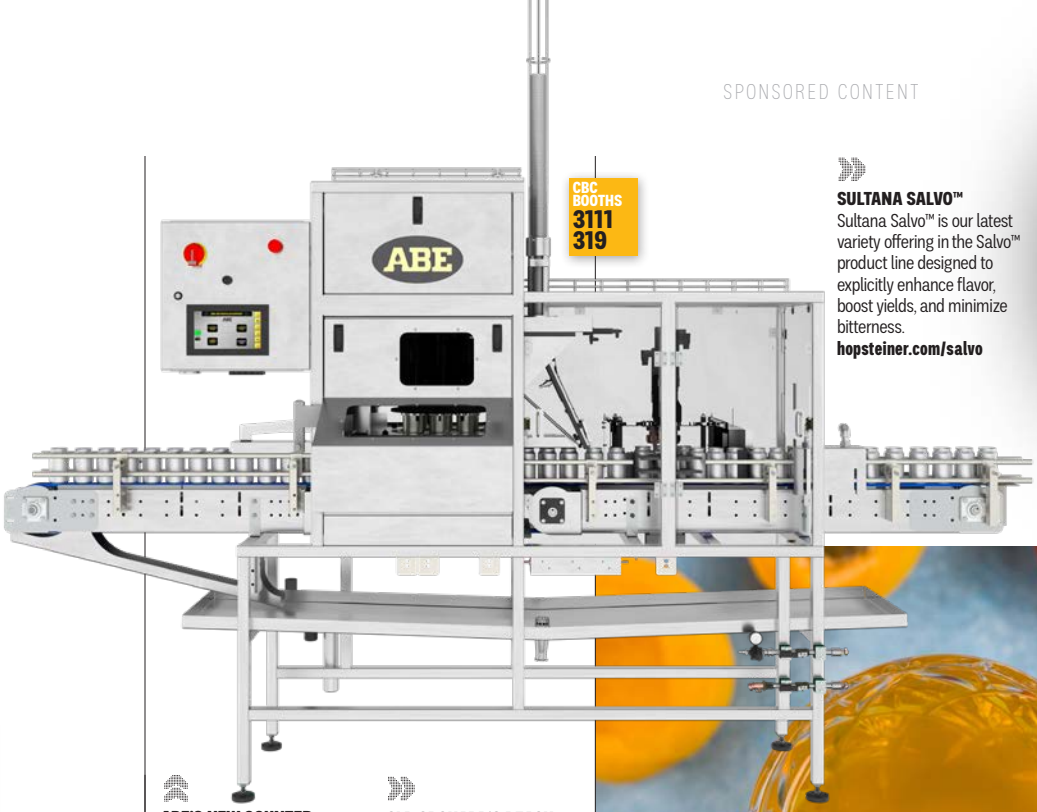


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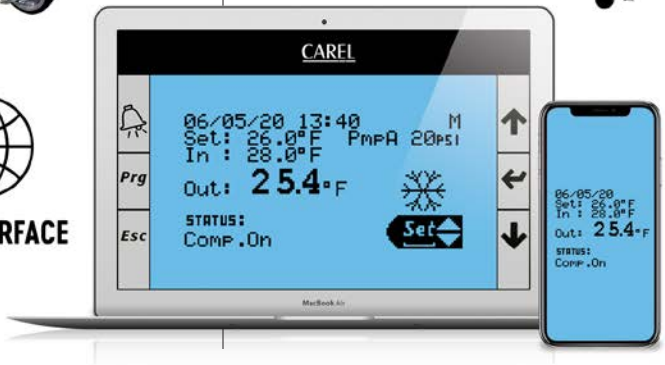


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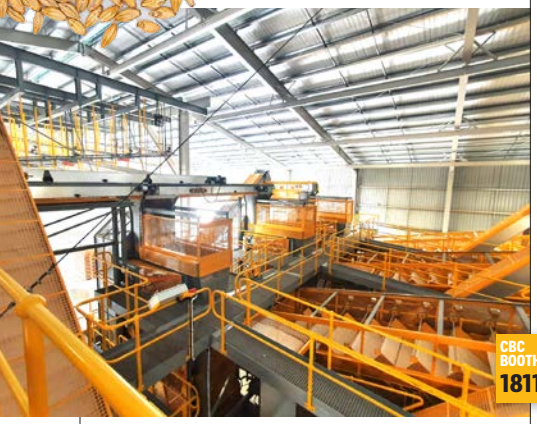

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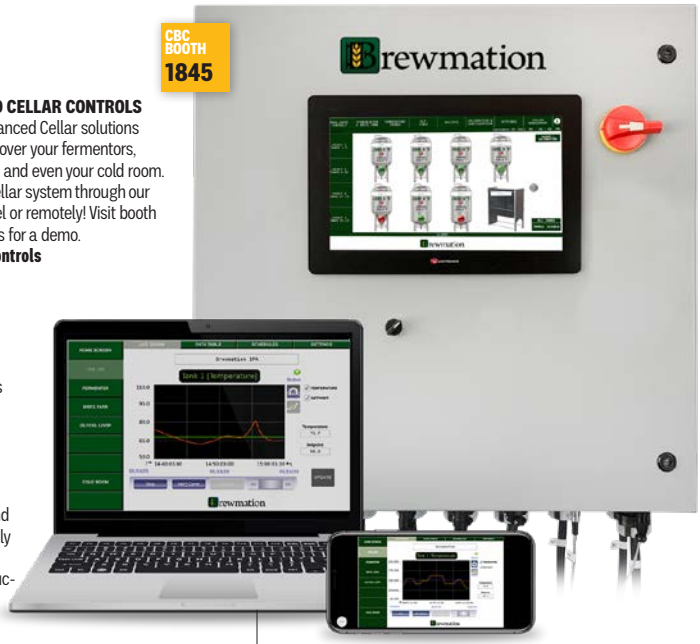


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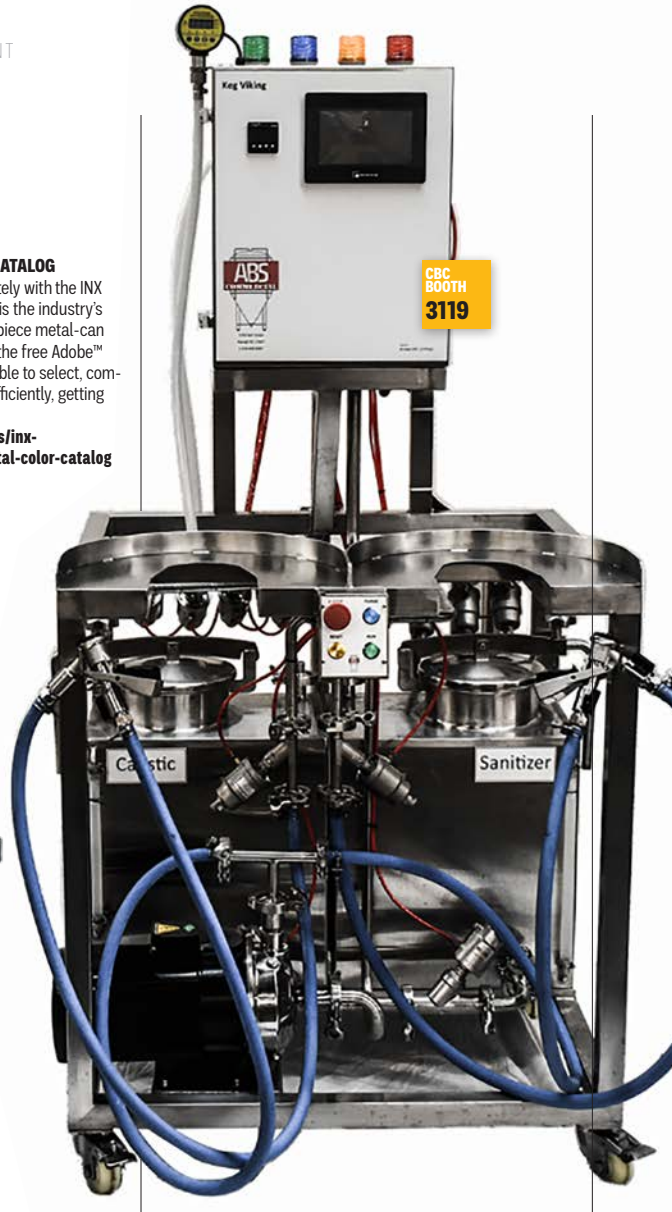



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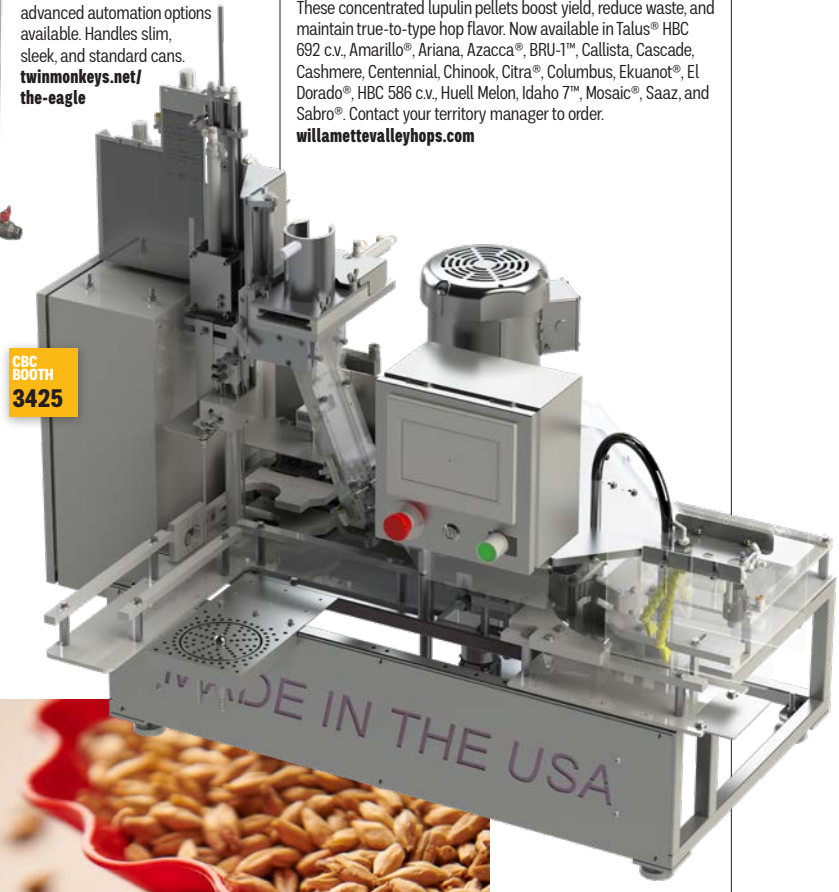


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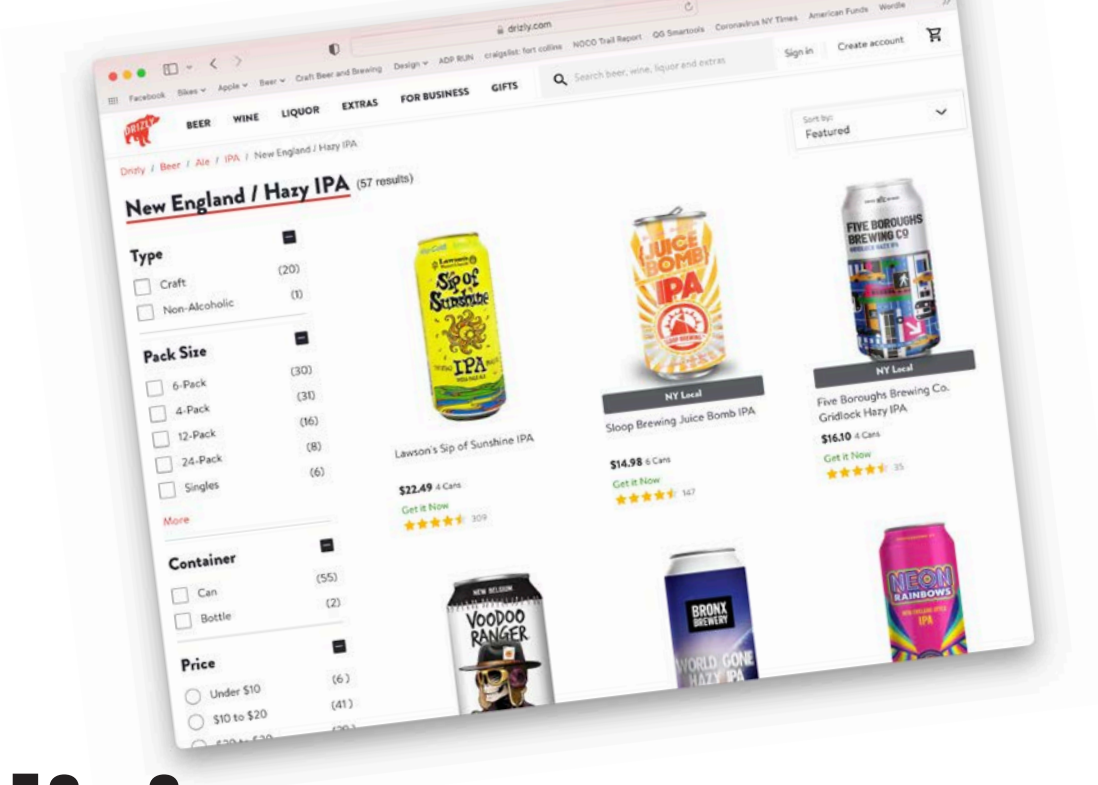


SELLING BEER

# Capitalizing on E-Commerce: Don't Overlook the Alcohol Marketplaces

Online alcohol marketplaces such as Drizly and Instacart aren't just for big beer. Here's how craft suppliers can work with retailers to boost sales on these platforms. **BY KATE BERNOT**

**IF YOUR BREWERY SELLS BEER** via distributors, your products might already be available through online marketplaces such as Drizly and Instacart. That's because those marketplaces source inventory from licensed alcohol retail outlets in a given geography—basically, they aggregate and display beer that's in stock at local liquor stores or grocery stores.

Many smaller craft breweries, however, may assume that there's nothing they can do to control their presence on such marketplaces or to maximize sales through that channel. The truth is, these marketplaces are growing fast, and small breweries that make an effort there can set themselves up for sales success.

The *2022 Alcohol E-Commerce Playbook*, released in December by Rabobank, reports that alcohol marketplaces such as Drizly and Instacart are 310 percent larger by sales volume than they were in 2019, netting $1.3 billion in sales ($234 million of which came from beer). The pandemic pushed more Americans to shop for alcohol online—a behavior that's likely to stick long-term for at least a third of those consumers, according to data firm Kantar.

The Rabobank report's author, beverages analyst Bourcard Nesin, is clear about the size of the opportunity: "E-commerce will be the number-one driver of industry growth over the next decade and a critical component of brand-building, awareness, and trial, both online and in-store."

This growth won't go only to big-beer brands: Recently, the fastest-growing beer brands on Drizly have included craft producers such as Dovetail, Pontoon, Thin Man, Empirical, and Vanished Valley. The four fastest-growing brands within Drizly's IPA category from 2020 to 2021 were all craft breweries: Scofflaw, Vanished Valley, Blackberry Farm, and Boneyard.

"At the aggregate national level, the big brands may top the list," says Dianne Hallock, director of B2B marketing for Drizly. "But at the market level, many craft brands are among the top 10 [in their local areas]."

Here's how you, as craft brewers, can put your best foot forward when it comes to an online alcohol marketplace presence.

## REALIZE THE OPPORTUNITY.

Drinkers who shop for alcohol online are squarely in craft beer's demographic wheelhouse. Compared to the average brick-and-mortar shopper, an online alcohol shopper is more likely to be wealthy, educated, and young, which is why craft beer over-indexes online compared to in–store sales. Nesin says that smaller, independent breweries absolutely can compete against the big brands in online marketplaces.

"I was speaking with some of the major players—macro breweries—and they were lamenting that despite their efforts, they're struggling for their brands to outsell craft in these marketplaces," Nesin says. "It's a function of demographics and the fact that the online consumer is

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hip and cool and wealthy and educated. They're craft-beer buyers, by and large."

Online marketplaces can also be a shopping tool that drinkers use to research beer that they later buy in-store. Because marketplaces get so much web traffic and because they spend money on search engine optimization and ads, a Google search for a certain craft beer may turn up a Drizly page before it turns up the brewery's own website. It's important for small breweries to have an up-to-date, polished presence on those marketplaces, even if customers don't end up purchasing the beer there.

John Dantzler, CEO and cofounder of New York City–based Torch & Crown Brewing, says that within weeks of launching cans in distribution, the brewery saw its beer for sale on marketplaces. Though the brewery offers its own direct-to-consumer beer sales and delivery on its website, it decided to embrace the fact that Torch & Crown beers were also available on marketplaces.

"We'd rather see more people enjoying our beer and see our beer in more people's hands and be a part of more New Yorkers' lives," he says. "If our retail partners are using third-party platforms to make that happen, then why shouldn't we be happy about it?"

## PRIORITIZE MARKETPLACE-CONNECTED RETAILERS.

Remember, breweries don't directly sell their beer through online marketplaces; those marketplaces aggregate inventory from local retailers. However, not all retailers are on Drizly or Instacart, so brewers who want to see their beer on those marketplaces should consider prioritizing retailers who list inventory on them. (While there are other alcohol marketplaces besides Instacart and Drizly, those two make up 86 percent of market share, up from 76 percent in 2019.)

The best way to ensure your brewery's beer is available on those marketplaces is to keep product in store at marketplace-connected retailers. According to Drizly's most recent retailer survey, conducted in November, 57 percent of the 500-plus retailer respondents say they plan to stock more craft beer in 2022 than they did the year before. If your brewery can't stock all interested retailers, and if e-commerce is a priority for your company, it might be wise to prioritize those with an online marketplace presence.

"If you're out of stock in Store A but they're not on Drizly, you're only losing in-store sales," Nesin says. "Whereas, if you're out of stock in Store B and they're on Drizly and serve a five-mile radius in a valuable area, you're going to miss out on more sales."

However, there's a flip side to that argument. Dantzler says Torch & Crown doesn't prioritize retailers with e-commerce offerings over those without one because employees at brick-and-mortar stores can provide a personal introduction to a brand when shoppers come in the store.

"Retailers are the personal touch," Dantzler says. "They give people a way to learn more about us, whereas the digital interaction, while much more convenient, maybe doesn't have that component. We're not prioritizing one over the other."

## OWN YOUR MARKETPLACE PRESENCE.

Online marketplaces draw data directly from retailers' point-of-sales and inventory systems. Yet breweries still have control over how their beer appears on those websites. Both Instacart (ads.instacart.com/signup) and Drizly (go.joindrizly.com/drizly-brands) allow producers to log in to their systems and directly manage their UPCs. That includes adding new products' UPCs, images, and descriptive text that tells the beer's or brewery's story. All of that is critical to ensuring that what a shopper sees about a particular beer is accurate and attractive.

If a brewery doesn't upload its own imagery or product description, marketplaces may show a blank photo space or try to populate the image from a database—sometimes with inaccurate results. This can cause customer confusion, for example, if a product is listed as being sold in a six-pack of 12 oz cans, but the image shows a single 22 oz bottle.

"Consumers are much more likely to [buy] if they see high-quality imagery," Hallock says.

Dantzler says it's now part of Torch & Crown's regular digital maintenance—along with checking Untappd, Google, and other places where the brewery's brand exists digitally—to monitor online alcohol marketplaces to ensure that products and imagery are accurate.

## FORGET ADS ON MARKETPLACES—FOR NOW.

Rabobank's e-commerce report found that large beer companies are spending big to prioritize their brands in online marketplaces. On average, beer brands spend 12 percent of their gross merchandise value on Drizly and Instacart "retail media," which typically include search placement (i.e., ensuring that a certain brand comes up first when a shopper searches "beer," for example, or paying to place it in a "featured products" carousel).

This adds up to huge budgets for retail media, and small breweries generally can't compete with those dollars. Nor should you—at least not right now: Because most alcohol marketplaces don't geotarget advertising, such advertising spending only makes sense for brands with national distribution and retail availability. There's not much sense in spending a lot to advertise your beer nationwide when it's available in only three states.

Large alcohol companies can also pay for insights and data from marketplaces, which small producers generally can't afford. Small breweries often cite the lack of data from these marketplaces as a gripe. Still, for Torch & Crown, it's a win to get its beer to a consumer, even if it doesn't end up with much information about that consumer.

"Not only do I not have the data, but my big-brewery competitors have it and can take actionable insights away from our sales," Dantzler says. "That's a challenge. But I think you weigh the pros and cons like anything, and we'd still rather be a part of consumers' lives, even if their data is sort of going into a black box."

Drizly says it's working to address this, and that more features (as yet unspecified) for smaller breweries will debut later this year.

"We're working really hard to roll out even more opportunities for smaller suppliers on Drizly in the first half of 2022," Hallock says. "We are incredibly excited about what's ahead for these brands on our platform as we know consumer demand is really strong."

**RABOBANK'S E-COMMERCE REPORT FOUND THAT LARGE BEER COMPANIES ARE SPENDING BIG TO PRIORITIZE THEIR BRANDS IN ONLINE MARKETPLACES. ON AVERAGE, BEER BRANDS SPEND 12 PERCENT OF THEIR GROSS MERCHANDISE VALUE ON DRIZLY AND INSTACART "RETAIL MEDIA." THIS ADDS UP TO HUGE BUDGETS, AND SMALL BREWERIES GENERALLY CAN'T COMPETE WITH THOSE DOLLARS.**

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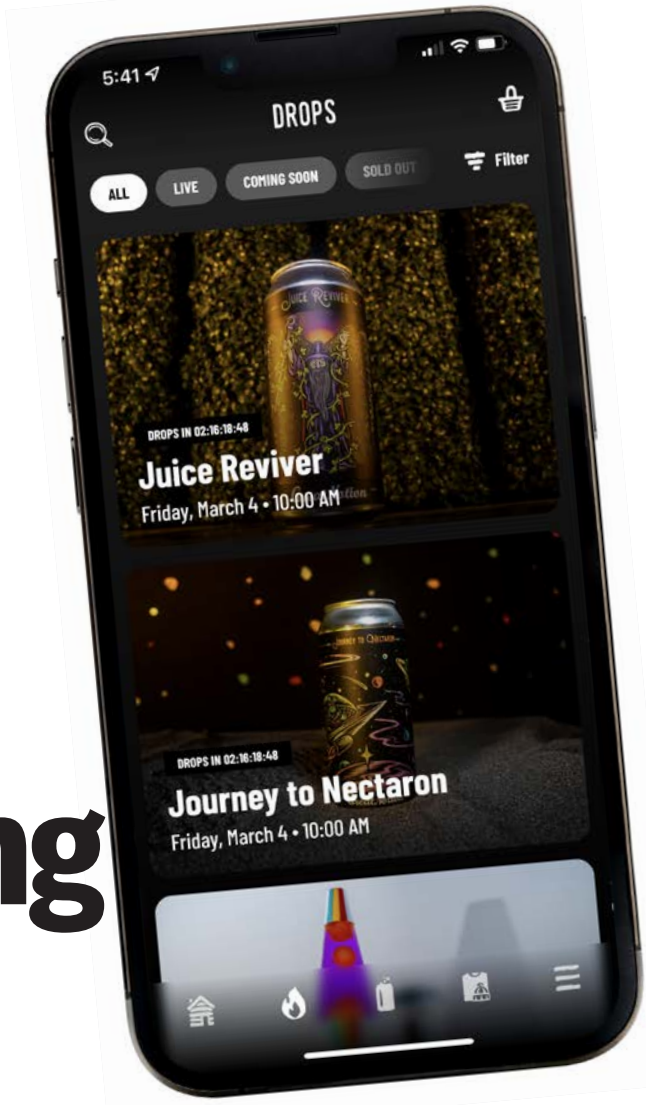



SELLING BEER

# Strategies to Drive Recurring DTC Orders

Recurring payments, exclusive memberships, loyalty rewards, and games are among the ways that breweries of all sizes can keep customers engaged in e-commerce. **BY KATE BERNOT**

**WINE KNOWS IT. COFFEE KNOWS IT.** Even razor companies know it: Sales models that encourage regular, repeat online purchases can be lucrative. Yet beer has historically lagged behind in the subscription realm because of a host of factors, including the high costs of shipping and the limited number of states—currently 13—that allow direct-to-consumer beer (DTC) shipments.

Spurred by the pandemic, several breweries of various sizes began betting big on recurring DTC shipments. It's already worked for wine: In total, U.S. wineries shipped more than $3.7 billion worth of wine directly to consumers in 2020, a 27 percent increase over 2019 according to a report from Sovos ShipCompliant and Wines Vines Analytics.

Here's how two breweries of vastly different sizes—Firestone Walker in Paso Robles, California, and Great Notion in Portland, Oregon—have taken different approaches to cultivating and managing recurring DTC orders.

## THE SUBSCRIPTION MODEL: FIRESTONE WALKER

Firestone Walker is bringing back its Brewmaster's Collective for its second year in 2022, after a successful first year for the membership-model club. Success, however, doesn't mean a glowing profit-and-loss statement when it comes to this project.

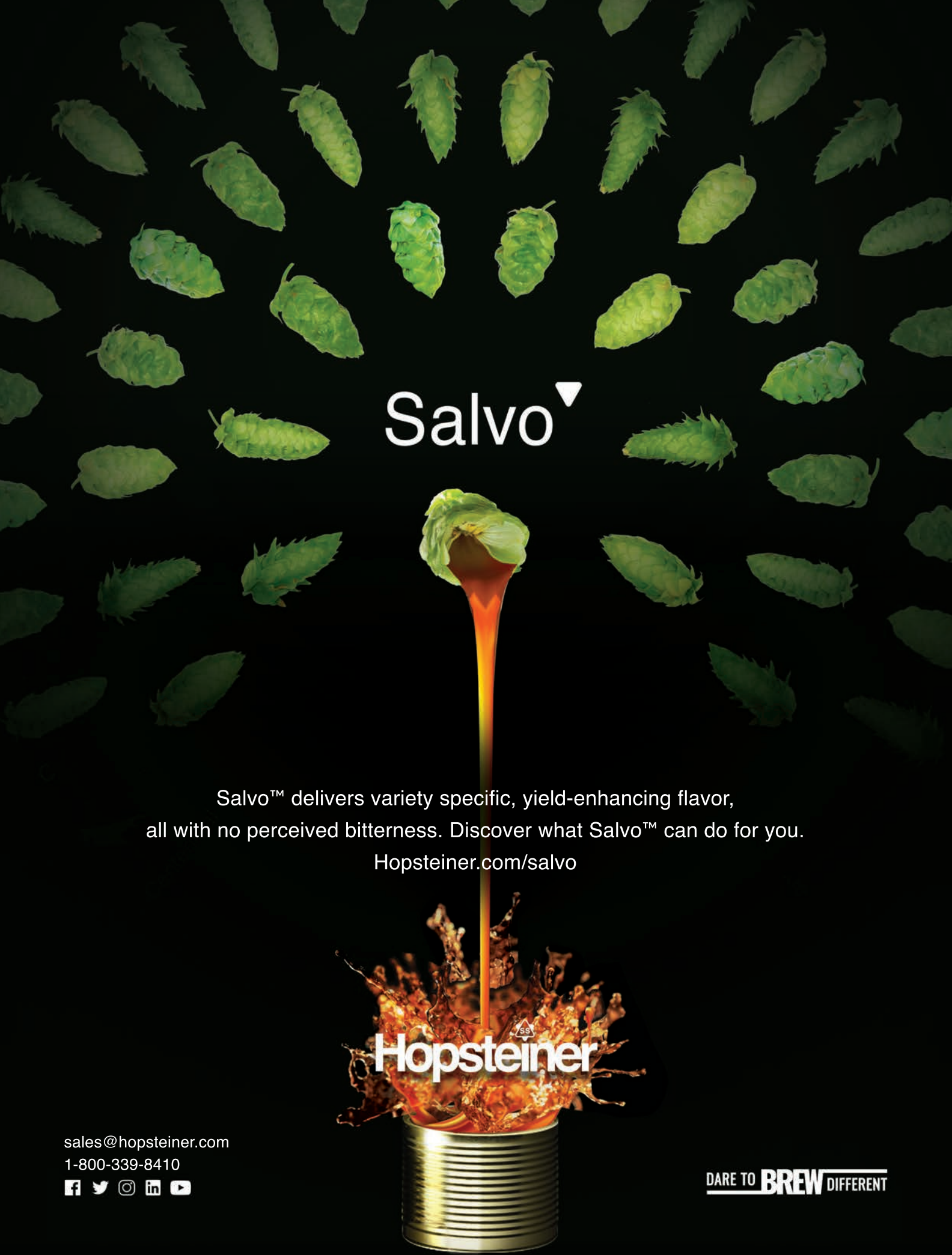
"If we measure the P&L on the beer club the way we measure the P&L on the rest of our business, it wouldn't always pass the sniff test," says Dustin Hinz, the brewery's head of marketing.

Instead, success means connecting directly with Firestone Walker's most dedicated fans—drinkers who are happy to pay $575 annually (or $625 in installments) for six shipments of 31 beers in total. Those include members-only beers that are never released anywhere else, as well as beers whose recipes the members have a hand in developing. The club currently ships to nine states, and this year Firestone Walker hopes to sign up between 2,500 and 3,000 members. Like the Firestone Walker Invitational, the Brewmaster's Collective has the goal of creating tangible connections between fans and the brewery, helping to inspire lifelong loyalty.

The club has perks for its members as well as for the brewery, which gets direct feedback via forms on every one of the beers sent to club members. Because

**"IT'S A VERY SMALL CONTRIBUTOR ON THE BUSINESS SIDE, BUT IT PUNCHES ABOVE ITS WEIGHT ON CONSUMER ENGAGEMENT. WE WANT TO ENGAGE FANS OF OUR BEERS, AND IN MANY CASES THESE RELEASES ARE SO SMALL, IT'S IMPOSSIBLE TO UNDERSTAND HOW A RETAILER OR WHOLESALER COULD MANAGE THE LISTING."**

PHOTO: SHUTTERSTOCK AND COURTESY GREAT NOTION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DARE TO BREW DIFFERENT

many beers are brewed only for the club, it affords brewmaster Matt Brynildson and his brewing team a wide latitude to experiment with techniques and ingredients, without worrying about how those beers might translate to retail.

"It's a very small contributor on the business side, but it punches above its weight on consumer engagement," says David Walker. "We want to engage fans of our beers, and in many cases these releases are so small, it's impossible to understand how a retailer or wholesaler could manage the listing."

What has most surprised Micaela Yeo, manager of club and specialty brands for Firestone Walker, is how many club members are relatively new to the brewery: About half have only been drinking Firestone Walker beer for a year or two before joining. She's also been surprised to see a higher-than-expected concentration of fans near the brewery's innovation brewery in Venice, California, leading the club to host some events there rather than exclusively in the Paso Robles headquarters.

While Firestone Walker's model does take a lot of coordination and spending on inputs—ordering specialty boxes and glassware for each release, paying for expensive cold shipping, etc.—Hinz says it's a model that could pay off in the long-term, even for the smallest brewery.

"The tools we're using are the same tools anyone can get access to," he says. "If you have a collection of passionate fans and you can get your product directly to them without the disruption of your three-tier system ... it's a lot of work, but it can totally work."

**THE APP IS ESSENTIALLY A LOYALTY CLUB, ENCOURAGING USERS TO EARN POINTS AND ACCRUE PERKS BY BUYING BEER, PURCHASING MERCH, VISITING A TAPROOM, AND SHARING THEIR GREAT NOTION BEERS ON SOCIAL MEDIA SUCH AS UNTAPPD OR INSTAGRAM. AS USERS ACCUMULATE POINTS, THEY MOVE UP IN THE APP'S FOUR MEMBERSHIP LEVELS.**

## THE LOYALTY MODEL: GREAT NOTION

Paul Reiter, cofounder and CEO of Great Notion, says the brewery always intended that DTC sales would be its primary focus. For years, that meant opening numerous taprooms, which now total five in the Pacific Northwest; another is planned for Sacramento, California. But in April 2020—just as the pandemic touched off in the United States—the brewery launched an app that had been in planning for more than a year.

The app is essentially a loyalty club, encouraging users to earn points and accrue perks by buying beer, purchasing merch, visiting a taproom, and sharing their Great Notion beers on social media such as Untappd or Instagram. As users accumulate points, they move up in the app's four membership levels, earning merchandise, early access to beers, and invitations to exclusive events along the way. The app also includes games and, soon, augmented-reality characters.

"Our whole ethos is, 'Keep beer fun,'" Reiter says. "So, we wanted the way customers purchase our beer to be super-fun."

That might sound simple, but it's a powerful retail strategy: Encourage people to buy your beer by making the actual experience of shopping enjoyable in and of itself.

While it's not a traditional monthly subscription model (though Great Notion is considering launching one through the app), the app encourages repeat purchases through rewards and gamification. Reiter admits the cost to develop and maintain it is high; Great Notion has an employee entirely dedicated to e-commerce, plus five to 10 more who regularly work to fulfill orders and coordinate logistics, and the company regularly pays external developers to work on the app.

The payoff has been worth it: More than 80,000 people have downloaded the app and created accounts. Today, sales through the app now represent a third of Great Notion's business.

The app works because it encourages repeat purchases, and the perks that come with buying more beer generate more marketing or sales opportunities for the brewery. For example, at the third loyalty level, a user gets presale access to beers that are likely to sell out. At the fourth loyalty level, a user gets a discount code for future purchases, among other rewards.

"The most tangible benefit to us is something like recurring revenue," Reiter says. "It's not recurring revenue in a traditional [subscription] sense, but it's recurring because our top users continue to buy so they can move through the ranks."

The revenue has been so important that Great Notion built a physical production and shipping center in Sacramento—they call it their "California fulfilment center"—to allow it to ship its beer throughout that state. California allows DTC beer shipping only if the beer is made in state, hence the new production brewery. That facility will be separate from the Sacramento taproom, which will open in this year.

"Tons of people comment about how easy we made it to buy beer," Reiter says. "[The app] is doing what we wanted it to do."


PHOTO: COURTESY FIRESTONE WALKER


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BEER INNOVATION

# Nonalcoholic Beer, Within Reach

Expensive equipment and a steep technical learning curve make contract brewing nonalcoholic beers an attractive option for smaller breweries. **BY KATE BERNOT**

**"I PRODUCED MANY MILLION CASES** of nonalcoholic beer and spent millions of dollars trying to perfect it, and I'll be very honest with you: I failed."

That's a frank assessment from Larry Sidor, cofounder and CEO at Crux Fermentation Project in Bend, Oregon. But he's not talking about Crux's nonalcoholic IPA, NØ MØ. He's talking about his multiyear career at Pabst Brewing in the 1980s, where his task was to develop nonalcoholic (NA) beers. Despite ample financial and technical resources at Pabst, Sidor never managed to brew an NA beer he was proud of. He estimates he spent about $10 million on research, development, equipment, and testing.

NØ MØ, he says, is "redemption."

The road to developing an NA IPA at Crux—while yielding results that Sidor is finally proud of—wasn't much easier. Despite small breweries' growing interest in brewing NA beers, the technology and procedural knowhow to make great-tasting ones still requires huge investment. Crux decided the investment in time and money was worth it, but many other small breweries have decided they can't justify the costs. Instead, they're turning to contract-brewing agreements to create NA products.

Equipment isn't the only barrier; knowledge is, too. Sidor keeps his NA brewing secrets close to the vest—not just in the press, but even to fellow brewers who taste NØ MØ and want to know how he does it. He estimates that he gets three such calls a week.

"We had to make some very significant investments in equipment," Sidor says, though he declines to say which particular equipment Crux purchased or how much it spent. "One of the phone calls I received was from a brewing professor, and he was asking me some hard questions that I was refusing to answer."

He says that while at Pabst, he explored cone centrifuging, fractional distillation, membranes, and selective-fermentation yeast to produce NA beers, though none of those methods on their own gave him the results he wanted. At Crux, he uses "kind of a combination of all or at least some of those." That's the most he'll divulge.

As the phone calls Sidor has received indicate, small brewers are interested in brewing NA beers even though NA beer sales are only about 0.5 percent of the total U.S. beer market in IRI-tracked chain-retail sales. Many small breweries are exploring this space, seeing it as one of the fastest-growing segments within craft beer in chain-retail sales—or, they simply want a house-made, NA option to serve at their taproom. Many see other breweries with the necessary equipment and knowhow and are happy to outsource their NA beer production.

## NA BREWING METHODOLOGY

There are three main techniques breweries are currently using to produce NA beer, each with its own benefits and barriers to entry.

- **Reverse osmosis with membrane filtration:** Reverse osmosis and membrane filtration are generally expensive, though some brewing-equipment manufacturers are beginning to produce them on a smaller scale.
- **Low-attenuation and maltose-negative yeasts:** Low-attenuation and/or maltose-negative yeasts are a new and promising innovation, but they require pasteurization to ensure the beer remains stable and spoilage-free. (For

**MANY SMALL BREWERIES ARE EXPLORING THIS SPACE, SEEING IT AS ONE OF THE FASTEST-GROWING SEGMENTS WITHIN CRAFT BEER IN CHAIN-RETAIL SALES—OR, THEY SIMPLY WANT A HOUSE-MADE, NA OPTION TO SERVE AT THEIR TAPROOM.**

PHOTOS: COURTESY CRUX FERMENTTION PROJECT

more about these strains, see "How Yeast Can Help Smaller Breweries Join the NA Beer Game," brewingindustryguide.com.)

- **Arresting fermentation before alcohol production:** Arresting fermentation is a common method to produce no- and low-alcohol beer, but it can require trial and error to ensure that fermentation is stopped before beer reaches its intended ABV. If the final product isn't pasteurized, acids need to be added to ensure that it reaches a specific pH that will inhibit the growth of spoilage agents.

Evan Kaslander, operations manager at Last Spike Brewery in Calgary, Alberta, has used all three to produce NA beer on contract for Last Spike's clients. Yet the learning curve for all these methods was steep.

"I can honestly say we have dumped more NA beer batches than alcoholic-beer batches just [because of] trial and error, and needing the quality to be there," Kaslander says. "Thankfully, we were working with some very understanding clients who knew that it basically was an R&D process, and they came into it knowing that."

Now, Last Spike's brewers have dialed in their methods and are comfortable using all three methods to produce NA beer, depending on which process the client prefers. (The brewery has a flash pasteurizer and a centrifuge, neither of which is affordable for most small breweries.) Currently, Last Spike brews NA beer for three clients, though Kaslander fielded NA beer inquiries from about five more in January 2022—likely because of increased attention around Dry January.

## A GROWING INTEREST

NA beer grew 24 percent last year in chain-retail sales tracked by data analytics firm IRI. That was the highest-percentage growth of any beer category. Overall, beer was down 0.4 percent, and craft was down 4.6 percent—though these numbers reflect tough comparisons to 2020's extraordinary boom in off-premise beer sales. Craft NA beer performed extraordinarily, up 1,400 percent in 2021 versus the year before. Of course, that's based on a relatively small base of sales: IRI tracked just $80,000 of NA craft-beer sales in 2021, making NA beer the second-smallest portion of craft-beer sales it tracks, followed only by craft malt liquor.


How big this segment can grow is still an open question, but it's easy to see that interest is growing, both from consumers and retailers. At Crux, Sidor says he sees much stronger attention to NA beer from retailers today compared to decades ago.

"I realized [NØ MØ] would be a success when our sales reps met with the large retail outlets and the retailers just said, 'Yeah we'll take X cases. Let's just do it,'" Sidor says. "And our reps would say, 'Well, do you want to taste it?' And retailers said, 'No, if it's non-alcoholic, craft, and it's local, we want it.'"

Not only is the product in demand, but contract-brewing NA beer can also cost breweries less than contract-brewing standard beers. At Last Spike, because of lower malt costs and decreased time in fermentation tanks—fermentation on NA beers can take his brewing team as little as a few days—Last Spike typically charges clients 30 percent less for NA beer versus standard beer. Pasteurization is an additional line-item cost, but even with that expense factored in, NA beers cost less to contract brew at Last Spike than their standard-strength counterparts.

Meanwhile, most breweries charge standard beer prices for NA beers, and they can even ship them directly to consumers, bypassing a distributor's margins. That can add up to good return on investment for breweries producing NA beers, even if they need to outsource their production.

**"I REALIZED [NØ MØ] WOULD BE A SUCCESS WHEN OUR SALES REPS MET WITH THE LARGE RETAIL OUTLETS AND THE RETAILERS JUST SAID, 'YEAH WE'LL TAKE X CASES. LET'S JUST DO IT. AND OUR REPS WOULD SAY, 'WELL, DO YOU WANT TO TASTE IT?' AND RETAILERS SAID, 'NO, IF IT'S NONALCOHOLIC, CRAFT, AND IT'S LOCAL, WE WANT IT.'"**

## "WE DON'T MAKE NA BEER, AND WE DON'T KNOW HOW TO."

In St. Louis, 4 Hands Brewing plans to add a year-round, NA beer brand to its lineup in 2022—but it won't brew the beer itself. It has partnered with fellow St. Louis company, NA beer specialists WellBeing Brewing. Together, they'll create a collaboration NA beer—likely a fruited sour or a lager—that both plan to sell through their respective sales channels. 4 Hands will sell it in Missouri, while WellBeing will likely sell it direct to consumers and in periphery markets.

"We don't make NA beer, and we don't know how to," says 4 Hands CEO and president Kevin Lemp. "And the team at WellBeing is really good at making NA beer. So instead of having all these rounds of R&D and trials and errors internally, let's reach out to friends and do something collaborative where everyone wins."

The beer will be the second collaboration between WellBeing and 4 Hands, who teamed up in 2021 on NA Liquid Rain IPA to benefit Hope For The Day, a nonprofit dedicated to proactive suicide prevention and mental-health education. The collaboration proved to Lemp that a year-round NA beer deserved a spot in 4 Hands' lineup.

"We want to build a portfolio so that whatever a customer is looking to drink at the moment, whether it has alcohol or not, we have something in our portfolio that can satisfy that desire," Lemp says. "NA beer, [because of] what has been happening with the [brewing] process over the last two to three years, I think there's a real opportunity in the space."

While seeing the white space for craft NA beer, Lemp is also adamant that it's not something 4 Hands needs to produce in-house right now.

"I have a really hard time investing in time and energy for myself and my team to try [to] create something when we already know people down the street doing it so well who'd like to work with us."


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MALT INSIDER

# Old Malt, New Tricks

Some brewers are turning to heritage barley varieties for malts that can add new character to their beers—and attract new fans. **BY BEN KEENE**

**JIM MATT GETS EXCITED TALKING** about his Uncle. He doesn't have endless anecdotes, and he won't go on and on about family reunions, but it's a subject he clearly loves discussing. And when the topic of his Uncle comes up, the conversation quickly turns to malt. That's because Uncle—a British-style mild that Matt first developed as a homebrewer some 17 years ago—has been on tap at the Rhinegeist Brewery since opening day.

"The reason . . . we use Maris Otter in Uncle goes beyond the slightly nuttier and richer flavor profile of that malt," says Matt, Rhinegeist's founding brewer and chief science officer. "Maris Otter always gave us better extract efficiency when we used it. Maris Otter–based beers also lautered much better on our original brewhouse. And most importantly, my intention was to have a somewhat less fermentable wort with a higher level of dextrins in the finished beer to prevent such a small beer [4.2% ABV] from feeling a little too 'thin,' if you will."

Rhinegeist brews Uncle 20 barrels at a time. Maris Otter is 85 percent of the recipe's base malt, with Rahr Pale Ale malt making up the remainder, while a handful of specialty malts add color and flavor. There are 770 pounds (350 kilos) of Maris Otter in each batch of Uncle. It also turns up in the Calfé coffee milk stout, Crumb Cake imperial red ale, and a number of limited releases. Matt says that in his hands, wort brewed with this heritage malt "usually lauters extremely well, clarifies well, and has excellent extract efficiency." Even so, the overseas shipping adds to its cost, so he has considered substituting a domestically grown heritage malt for Maris Otter. The one thing he won't do, however, is stop brewing Uncle anytime soon.

"I know classic styles are not 'in vogue' at the moment, but I can't emphasize enough how passionate I am about that beer and [how much I] love watching people in the taproom enjoy it," he says.

**"MARIS OTTER ALWAYS GAVE US BETTER EXTRACT EFFICIENCY WHEN WE USED IT. MARIS OTTER–BASED BEERS ALSO LAUTERED MUCH BETTER ON OUR ORIGINAL BREWHOUSE. AND MOST IMPORTANTLY, MY INTENTION WAS TO HAVE A SOMEWHAT LESS FERMENTABLE WORT WITH A HIGHER LEVEL OF DEXTRINS IN THE FINISHED BEER TO PREVENT SUCH A SMALL BEER FROM FEELING A LITTLE TOO 'THIN,' IF YOU WILL."**

## THE BRITISH HERITAGE MALTS

Maris Otter, first bred in 1965, is arguably the best-known variety of heritage malting barley, followed closely by Golden Promise, another product of the 1960s. Most of today's widely cultivated varieties are the result of gains achieved by modern barley breeding for both disease resistance and yield. Growers typically phase out varieties that don't perform as well agronomically after a decade or two. Maris Otter, however, has bucked this trend. Demand from brewers who appreciate its enzymatic strength, low nitrogen content, and characteristic flavor has kept acres planted for almost 60 years.

In fact, when Maris Otter fell off the list of varieties approved by the Maltsters' Association of Great Britain, a consortium of grain merchants bought the rights to it.

PHOTO: COURTESY PALOUSE HERITAGE

They propagated a new true-to-type crop via a process of re-selection.

At present, U.K.-based Crisp Malt is the single largest buyer of Maris Otter barley, distributing its Maris Otter Ale and Extra Pale Maris Otter malts to the United States through BSG CraftBrewing. About five years ago, the 150-year-old Crisp also reintroduced a small-batch, floor-malted version of its Maris Otter malt, slowly kilning it over three days to enhance the final product's flavor and aroma. Building on this foundation, Crisp has since added three more heritage varieties to its portfolio: Plumage Archer, the first commercially produced cross-bred barley; Chevallier, England's dominant malting barley until about 1920; and Haná, a landrace variety that originated in Czech Moravia and helped pilsner take the world by storm.

"They all have fantastic stories, but more importantly, they all have distinct flavor profiles," says Colin Johnston, Crisp's craft sales and marketing team manager. "There's been massive interest around the world, and the demand is now outstripping supply."

## HERITAGE & U.S. CRAFT: UNLOCKING THE POTENTIAL

When it comes to recipe design, creative brewers have long appreciated access to a wide range of malt and hops. But there's more to the recent resurrection of landrace barleys than simply expanding a malting portfolio—especially when those products demand premium prices that may make customers think twice.

Some brewers gravitate to Maris Otter or Chevallier because of the character it adds to particular beer styles. Others find appeal in the history and legacy of a particular variety, drawn perhaps to a sense of tradition connecting them to their brewing forebears. Still others see long-term possibilities in heritage malts, viewing them as potential game changers rather than niche relics of an earlier era.

Seattle's Fair Isle Brewing is one such business. Since opening in the Ballard neighborhood in 2020, Fair Isle has brewed distinctive, mixed-culture beers with ingredients farmed and foraged in the Pacific Northwest. One such is a dry, bright saison called Leila; its grain bill is evenly split between Baronesse pilsner malt and Purple Egyptian pale malt. Baronesse, a two-row heritage barley, originally was developed for Germany's brewing industry but found a market as feed barley in the United States. Purple Egyptian, on the other hand, is a six-row hull-less barley with ancient origins in the Middle East.

PHOTO: COURTESY PALOUSE HERITAGE

**"PURPLE EGYPTIAN OFFERS US THE CHANCE TO USE A PRODUCT THAT WE FIND MORE ROBUST IN FLAVOR THAN MASS-PRODUCED MALTED GRAINS WHILE BEING MORE ECONOMICALLY SUSTAINABLE TO FARM. WHAT STARTED AS A PILOT BATCH TO TEST OUT THIS HERITAGE GRAIN HAS TURNED INTO A CORE BRAND AND SUCCESS IN PRODUCT DEVELOPMENT FOR US."**

"At Fair Isle, we like to say everything is done with intention," says brewer Matt Rowe. "This is especially true when considering what grain to use. Purple Egyptian offers us the chance to use a product that we find more robust in flavor than mass-produced malted grains while being more economically sustainable to farm. What started as a pilot batch to test out this heritage grain has turned into a core brand and success in product development for us. Going forward, Leila will be brewed in 30-barrel [batches]."

The Purple Egyptian barley used by Fair Isle grows at Palouse Heritage's Palouse Colony Farm in Eastern Washington before being malted by LINC Malt in Spokane. Rowe describes the character as nutty and cashew-like, and he says it contributes softness and roundness to mouthfeel.

Rowe says he's made five different beers with Purple Egyptian pale malt, including a single-malt experiment that's aging in oak for a future release. However, as much as he likes working with this heritage grain, it isn't without its challenges. Like rye, the malt is high in beta glucans, so the mash takes some encouragement. Rowe says that Fair Isle typically gives Leila a single-temperature infusion mash at about 148°F (64°C) but is adding a beta-glucan rest around 113°F (45°C) to get a more fermentable wort. Lacking hulls, Purple Egyptian can also be a challenge to lauter.

Brian Estes, partnerships director for LINC Malt, says it's true that colored barleys tend to be higher in beta glucans, and he suggests rice hulls or another hulled base

malt help with filtration. However, he says that LINC approaches malting with the goal of "trying to let the barley itself talk."

Besides Purple Egyptian barley, LINC malts three other heritage grains: Scots Bere barley, Red Russian Wheat, and Sonoran White Wheat. The acreage for all four is relatively small, which influences availability and price point. However, according to Estes, heritage-malt sales have grown in proportion with the company's overall sales, and LINC is actively pursuing expansion beyond its two four-ton units.

There are other advantages beyond character: While landrace barleys are lower yielding than modern malting varieties, Estes says they are also resilient, better able to withstand weather extremes and environmental pressures.

"The limitation is always going to be yield, and it is significant—as much as half," Estes says. "These grains are always going to have a relatively niche use. I love working with brewers [who want] to take time to get to know and apply these grains—it feels like an extension of the time and care that has been put into their production by the folks at Palouse Heritage, who have often had to grow out their own seed supply from an initial handful of grain—and even more, a recognition of the generations and centuries over which these varieties have been cultivated."

## TINKERING IN PROGRESS

In Chicago, Dovetail Brewery decided to work with a heritage malting barley for the first time late last year.

The connection between Dovetail and Indiana-based Sugar Creek Malt, founded by Caleb Michalke, began when Michalke's father visited the Dovetail taproom, introduced himself, and left a phone number. Dovetail cofounder and master brewer Hagen Dost liked the story and called the young maltster.

One of the first things Michalke brought up during their conversation was his effort to reintroduce a two-row variety descended from Czech Haná and bred in Austria just after the First World War. Starting with 200 grams of seed in 2016, Michalke was able to reap more than 6,000 pounds (2,720 kilos) of grain last summer. Dost agreed to buy some of the resulting malt, which Michalke called Edelweiss.

Riffing on Dovetail's Pilsner, brewed with Saaz hops and a re-creation of soft Plzen water, Dost and his team subbed in Sugar Creek's Edelweiss base malt for the Bamberger Mälzerei Pilsner malt they typically use. The 21-barrel batch was then triple-decocted, open-fermented, and lagered for about seven weeks. Dovetail released Sugar Creek Pilsner in early January, canning 30 cases and kegging the remainder.

To the surprise of marketing manager and brewer Jenny Pfäfflin, the cans sold out in less than six hours.

"Ultimately, we were very pleased with the outcome," Pfäfflin says. "Compared to our standard Pilsner, the Sugar Creek Pilsner has notes of flour and fresh-baked bread, while our Pilsner is more water cracker and light bread crust. The Sugar Creek Pilsner is also noticeably lighter in color. It was a fun project to work on the same recipe with the same processes and see how things change when you swap out the malts."

Dost, a former mechanical engineer, says that Dovetail will brew with Edelweiss again and that he appreciates the beer's doughy flavor. However, he describes Sugar Creek Pilsner as a prototype and an ongoing project. Like Purple Egyptian barley, Edelweiss is higher in beta glucans, and Dost says that both the mash efficiency and the original gravity were lower than they normally are for their Pilsner.

"I think [Michalke] was pretty conservative on the kilning, and it wasn't as modified as the malt we normally use," Dost says. "He's still learning how to malt that particular variety."

Michalke did have five years to experiment with Edelweiss, and he was able to get its protein level down to 10.5 percent. It's highly undermodified, but he sees promise. And after collecting feedback from breweries such as Dovetail, Michalke has big plans for his landrace variety.

In 2022, Michalke expects to malt at least 50,000 pounds (22,600 kilos) of Edelweiss, some of which will become a Vienna malt. If he succeeds, it will be quite the comeback for a heritage barley that was gathering dust in an Austrian seed bank.

For a certain kind of passionate brewer, it will also be quite the opportunity.


PHOTO: COURTESY DOVETAIL BREWING

MALT INSIDER

# A Rough Year for Malt

A historically poor barley harvest has piled on to supply-chain and cost issues that independent brewers have been facing with raw materials. Here's what you need to know before placing your next order. **BY BEN KEENE**

**"WE HAVE A COUPLE OF MONTHS** where the crop is either made or broken: June and July," says Chris Riggers, co-owner of Clearwater Farms in North Idaho. "The crop looked nice coming up—we had good moisture underneath from snow melt. But the heat in June was pretty unprecedented. And we got no rain in July. The lack of precipitation just shattered records."

Riggers grows about 1,000 acres of LCS Genie and AAC Connect malting barley in Nezperce. He sells the former to Montana Craft Malt in Butte and LINC Malt in Spokane Valley, Washington, while the latter goes to Great Western Malting. Like many farmers in America's primary barley-growing regions, Riggers did not have a good year. In 2020, his fields averaged about 6,700 pounds of barley per acre (or about 7,500 kilos per hectare)—an all-time high. In 2021, that number was closer to 2,600. What's more, protein levels were higher than usual, coming in at almost 14 percent.

"We still had pretty good plumps," says Riggers. "That was a nice surprise. Some years you take a beating though."

## RECORD HIGHS, HISTORIC LOWS

Last year, barley farmers in Idaho, North Dakota, and Montana definitely took a beating. It came in the form of a one-two punch: record-high summer temperatures and drought conditions during much of the growing season. In its most recent report on small grains, the USDA revealed that barley production was down 31 percent from 2020, with the average yield down almost 17 bushels per acre to 60.4. East of Clearwater Farms in central Idaho, growers in Montana saw higher protein levels like Riggers did—but they also ended up with a higher number of thin kernels and roughly half of their normal yield.

In fact, according to Cassidy Marn, executive director of the Montana Wheat and Barley Committee, 2021 was the state's lowest production since 1919.

Given that Montana, Idaho, and North Dakota typically produce about three-quarters of the country's barley, a harvest outcome like this is very bad news. Heat stress and drought stress will both drive up protein and beta-glucan levels. Across the border in Canada, the situation wasn't any better. In its 2021 Canadian Barley Harvest and Quality Update, the Canadian Malting Barley Technical Center (CMBTC) described the past year as "one of the worst growing seasons in a generation." Average yields in the Prairie Provinces were a dismal 43.6 bushels per acre. Unfortunately, the few bright spots in the USDA's report—New York, Pennsylvania, and Virginia, for example—weren't significant enough to offset historic shortfalls elsewhere.

"There were certainly still areas that performed at or above their recent historical

**IN ITS MOST RECENT REPORT ON SMALL GRAINS, THE USDA REVEALED THAT BARLEY PRODUCTION WAS DOWN 31 PERCENT FROM 2020, WITH THE AVERAGE YIELD DOWN ALMOST 17 BUSHELS PER ACRE TO 60.4.**

PHOTOS: MATT GRAVES/WWW.MGRAVESPHOTO.COM

averages," says Bart Watson, chief economist for the Brewers Association. "Those were mostly states that are pretty different geographically or use a lot of irrigation. The challenge is that most of them are tiny compared to the big barley-growing states."

Brewers looking to European malt houses for encouragement aren't likely to find it. Generally speaking, the situation in Europe was a mixed bag, with Britain and France experiencing average harvests while the Czech Republic and Germany saw lower yields. Walter König, managing director for Germany's Brewing Barley Association, says the supply for quality malting barley is "more than tight." He adds that many growers harvested grains that received a poor grading.

"I have not experienced such a situation in my more than 25 years in the business," König says. "Small grains have less extract, so the extract efficiency in the brewhouse is reduced. What we are much more concerned about is the impact of the weather delaying the harvest into September. Phytosanitary issues and sprouts, but also wet-stored lots, carry a much higher potential of challenges in processing than slightly less extract yield."

## WHAT DOES IT MEAN FOR MALT?

This isn't the first time the malting and brewing industries have had to deal with a disappointing barley crop. The 2002 growing season was unkind to barley farmers, too. However, there were far fewer breweries in business 20 years ago than there are today—more than 7,000 fewer, in fact. Most brewers simply haven't faced a situation like the one they do now.

"The biggest thing today is that craft brewers are going to be shocked by the prices they see on their next malt invoice," says Brent Atthill, owner and managing director of RMI Analytics, a market insights and networking platform focused on the brewing-materials supply chain. "In my view it's going to be a tough year or two."

As Atthill explains it, the price of barley has remained fairly steady for the past few years, and this may have fostered a degree of complacency from brewers. Adding to that general lack of concern, demand for malting barley was somewhat lower in 2020 because of the pandemic, and stocks were generally plentiful—nobody was particularly worried about supply going into 2021. However, demand edged closer to pre-COVID levels last year, as states eased social-distancing requirements and vaccinations became available. Meanwhile, China's appetite for both feed and malting barley has recently increased sharply, driving up the price further. At the same time, wheat and corn production slipped in 2020; that increased the value of these cereal crops and sent barley prices rising even before this year's poor harvest.

"Barley is a niche crop, and that means barley gets pulled in whichever direction the big tide goes," Atthill says. "It's [influenced by] all these other markets, like corn. The market moves to find the right equilibrium. It's doing exactly what it should."

Besides cost, brewers face another challenge: Malt quality is likely to see more variation this year. It might not suffer as much as experts suspect it might, but don't expect to see the same values on your certificate of analysis (COA).

With an inverse relationship between protein levels and extract potential, values

**FIRST OF ALL, BE PREPARED TO BUY MORE MALT AND PAY HIGHER PRICES. MAYBE YOU'LL GET LUCKY, OR PERHAPS YOU WORK WITH A SMALLER MALTHOUSE THAT SOURCES GRAIN FROM A REGION THAT FARED BETTER IN 2021. HOWEVER, JUST TO BE SAFE, CONSIDER THE POSSIBILITY THAT YOU'LL NEED TO ADD A BIT MORE GRIST TO YOUR MASH TUN IN THE FORESEEABLE FUTURE.**

greater than 13 are going to require flexibility during mashing to avoid lautering issues, chill haze, poor head retention, and the possibility of darker beer created by higher levels of soluble protein. Higher beta-glucan levels also can negatively impact lautering and filtration.

At the CMBTC, managing director Peter Watts says he believes maltsters could end up blending more lots to maintain consistency across their incoming inventory. He also says they may need to loosen their ordinarily tight specs. "With protein levels north of 14, we're getting into uncharted territory here," he says. "What the malting companies will say is, 'Get ready for high-protein malt.'"

Not everyone agrees that this year's harvest will result in qualitative differences to brewers at the end of the supply chain, however. At the Montana Wheat and Barley Committee, Marn is one who says she doesn't expect a drop in quality. Instead, she says, low yields will simply "tighten up supplies considerably."

## MANAGING THE CHALLENGE

So, we know the malting-barley outlook isn't great. But beyond simply taking your lumps, what's a determined brewer with a glass-half-full attitude supposed to do?

First of all, as Watts at the CMBTC succinctly put it, be prepared to buy more malt and pay higher prices. Maybe you'll get lucky, or perhaps you work with a smaller malthouse that sources grain from a region that fared better in 2021. However, just to be safe, consider the possibility that you'll need to add a bit more grist to your mash tun in the foreseeable future.

At the Brewers Association, Watson also says brewers who source malt from Europe should try to plan farther ahead; they may see additional costs because of shipping increases. Some brewers already have encountered imported-malt delays that required recipe modification.

Whether they adjust quality specs or not, malting companies will strive to maintain a consistent product through the means available to them: grain-drying duration, steeping and germination time and temperature, malt blending, and more. Also, in many ways, success in the brewhouse comes down to the strength of the relationship between brewer and supplier. Reach out to the malting company or companies with whom you work and don't be afraid to ask questions early and often. Request malt samples. Use the hot-steep method to compare known malt with a newly received sample. Inquire about your malt's lot or batch and ask if and when new lots are expected. If you've saved COAs from previous orders, compare them with COAs for any new orders.

Take a proactive approach: Get ahead of any problems by first training a critical eye on your process, equipment, and instrumentation. Running a small brewery requires wearing many hats; it's easy to slip into autopilot on the brew deck, especially when it comes to the core beers you make month in and month out. However, the better you understand your brewhouse and its capabilities, the more prepared you will be to handle a malt supply with metrics that vary from the values you're accustomed to seeing. Then, once you've performed an audit of sorts, proceed cautiously but deliberately.

"A slow shift between proven and new can avoid surprises and problems," says König at Germany's Brewing Barley Association. "We don't have many more options than [spitballing] and timely technological influence from mash-in temperature to boil times."

Ultimately, 2022 may well be another difficult year for the industry, but it's important to remember that higher costs and greater variability in terms of malt quality are surmountable obstacles. Plus, even an average barley crop this year will go some distance toward repairing things. In the meantime, breeders continue their work developing varieties that are more heat- and drought-resistant, and growers will continue to do what they can to minimize the stress their crops endure.

At Clearwater Farms in Idaho, Riggers remains optimistic. He says the past growing season spurred him to learn fertility-management lessons that might help mitigate the problem of higher protein in the future.

"It may be more painful for some than others," he says, "but I'm confident we'll get through it."

MALT INSIDER

# Storage Wars

The enemies of fresh malt are many, and some have legs and multiply. The damage can be costly. Here are practical tips on keeping your grain high, dry, and free of critters. **BY BEN KEENE**

**IF YOU'VE BEEN A BREWER** long enough, it's probably happened at least once: Something truly strange turns up in a shipment of malt—links of chain, a forklift light, plastic pellets, a cargo strap, half a pair of broken scissors. However, those moments are rare. Typically, the malt you're about to brew with is clean, dry, and free of extraneous objects. So, when you do end up with something strange in the Super Sac, the one thing you *really* don't want to find is evidence of insects or other pests.

"If you discover a pest, it's already too late," says Matt Drew at Montana Craft Malt in Butte. "You have to assume if you find a pest in any part of your facility, it's everywhere." Drew, who worked as a maltster for a couple of years before landing at Montana Craft Malt as marketing director, is speaking from experience. When a small green beetle appeared in his employer's malt storage facility, it was "everything he could do to keep the grain clean."

While he's no longer steeping, germinating, and kilning barley, he does have recommendations for brewers: Develop standard operating procedures for handling and storing malt, and have a plan for dealing with rodents, birds, and insects. Maintaining cool, dry conditions with ample airflow is the name of the game because lower temperatures and drier conditions tend to increase shelf life.

However, it's easy to let you guard down. Woven polypropylene sacks can tear, paper malt bags are prone to puncture, and malt is hydroscopic, meaning it will absorb moisture from its surroundings—especially if bags are stored in a humid environment or aren't properly sealed. Damp malt won't mill properly, and it can become moldy, which leads to oxidation. Malt also will absorb ambient odors, further compromising its quality. Meanwhile, mice can fit through openings as small as a dime. In other words, stay vigilant.

As Drew says, the one time you're not looking for a spoilage issue is when something will happen.

## CLEAN LIKE YOU MEAN IT

At Mirror Image Brewing in Frederick, Colorado, north of Denver, managing partner and head brewer Theresa Schirner has been there.

"When I became head brewer in 2019, we consolidated from two units to one," she says. "As we were cleaning and rearranging the back of house, we ran into some flour beetles. There were oats sitting on the top of our grain shelves [that] had probably been there a while. The beetles had found their way into the bag, created several generations of family members, and then outgrew their space and moved—fell—down to the next shelf. The hardest part of the removal process was that you could not disturb the bag too much without [the beetles] falling onto the next item, so we had to very carefully remove [the bags] into plastic bins and then transport them out."

Shirner says it took several days to get rid of the beetles and establish a clean and sanitary storage area, but Mirror Image has been beetle-free ever since. Today, the brewery produces about 275 barrels a year, typically working through its grain orders

PHOTO: COURTESY ARIZONA WILDERNESS

**"THE MOLD [WAS] INSIDE THE CHAIN-VEY SYSTEM, WHICH MEANS THE ENTIRE SYSTEM [NEEDED] TO BE DISMANTLED, CLEANED, AND RESEALED BEFORE WE [COULD] ORDER BULK GRAIN AGAIN."**

in about three weeks. These days, the most common pest the brewing team faces is camel spiders. Regular dusting, web removal, and the judicious use of food-grade bug spray keeps these arachnids at bay. Meanwhile traps and a healthy amount of vigilance tend to be enough to deter mice during Colorado's chilly falls and winters.

For anyone looking to avoid a pest problem at their own facility, Shirner has straightforward advice: "Take the time to organize and clean," she says. "Whether it is dusting, mopping, or getting a good scrub in, it's good practice. Set the expectations with your team so that being organized and clean is in your daily practice."

At Waypost Brewing in rural Michigan, co-owner and head brewer Hannah Lee says that regular cleaning and maintenance are her watchwords, too. With the brewery so open to the outdoors, adequate ventilation is not a problem. That said, she does appreciate the pest-control help she gets from some dedicated volunteers: a pair of farm cats.

"Fortunately, we haven't had anything too terrible to deal with here on the farm—knock on wood," Lee says. "Prevention, regular cleaning, [and] maintenance helps. And of course, the two cats seem to be highly efficient at their jobs."

## ORDER SMALL, ORDER OFTEN

Cleanliness is certainly important at any facility where food or drink are the final product. At Wild East Brewing in Brooklyn, New York, cofounder and head brewer Brett Taylor adds another rule of thumb: Use your malt as quickly as possible.

Taylor brews on a 30-barrel system. He says he generally orders enough grain for one to three batches of beer, no more than two pallets' worth of 50-pound bags. Once he's received a shipment, it's first in, first out. Rarely does he have malt on his pallet rack for more than two weeks.

"We're pretty hand-to-mouth for financial, space, and logistics purposes," he says. "I pay dearly for my 7,000 square feet [650 square meters]. So, I can't have pallets taking up too much space at any given time."

Generally, raw grain can be kept for two years without compromising quality, while malted barley retains its quality for up to a year when stored properly. For highly kilned malts, that timeline can be longer. Yet for Wild East and other smaller breweries that are trying to balance profitability and efficiency while serving a relatively small geographic area, fresh malt is rarely a concern. Taylor says that his lagers turn over so quickly that he never really loses sleep over the best-by dates on his Rahr or Weyermann malts.

"My bigger concern is making sure I reserve enough floor-malted Bohemian pilsner malt before it sells through," Taylor says. "Kind of the opposite of worrying about freshness."

In Western Massachusetts, Element Brewing co-owner and brewer Dan Kramer usually orders just one pallet at a time, aiming to work his way through it in two to three weeks. Kramer and his business partner Ben Anhalt purchase pre-milled malt, which has a shorter shelf life. By working quickly through a small supply and keeping storage areas clean, they have avoided infestation for more than a decade and never had the need for an exterminator.

"We try to keep our inventory to a minimum," Kramer says. "We go through our base malts as quickly as possible and store partial bags of specialty grain in a stainless-steel container. We don't have a mill, so we buy pre-crushed grain, which is another reason we try to use it quickly."

## STAY COOL, KEEP DRY

Across the country in Seattle, Washington, Stoup Brewing also tries to get through open bags of malt as quickly as possible. Co-owner and head brewer Brad Benson says they order base malt by the truckload—48,000 pounds at a time (about 21,800 kilos). They store the grain in a silo that gets inspected for pests quarterly, while a sealed shipping container protects specialty bagged malts from pests and spoilage. While Benson says he knows of a nearby brewery that had an infestation of red flower beetles in its silo, the only nuisances Stoup has contended with are mice and rats.

Instead of pests, he worries about moisture ingress during western Washington's lengthy wet season, which can stretch from mid-October well into April. Dry malt performs best when it's time to mill and mash, and commercial malt typically has a moisture content between 3 and 6 percent. At Stoup, Benson stresses the importance of maintaining air movement in malt-storage areas.

"We run a dehumidifier in our bagged-malt room—especially in the Seattle rainy months—which helps to keep the malt from picking up moisture," Benson says. "Sealed bags of malt fare well. However, open bags, pre-milled malt, and flaked grains cause the biggest problems. Always be checking on your malt. Our eyes and palates are the best way to find problems early and get them fixed before they get too big."

Patrick Ware, cofounder and head of brewing operations at Arizona Wilderness Brewing in Gilbert, Arizona, also stores his malt in a grain silo—albeit one that holds 6,000 pounds (about 2,700 kilos), as opposed to Stoup's 60,000-pound capacity silo. Ware says the relatively small size of the vessel works well for the brewery; it typically uses that much malt monthly, helping to ensure the supply is always fresh. Sourcing all his base malt from Sinagua Malt, Arizona's first commercial maltster, is another way that Ware can be assured of freshness.

However, as with Benson in Seattle, it was moisture and the problems that it can generate that proved to be a source of frustration for Ware in 2021. Not usually an issue in the Grand Canyon State's dry climate, mold reared its ugly head at Arizona Wilderness when it found its way inside the brewery's tubular drag conveyor system.

"The mold issue [was] very challenging because the system is somewhat complicated," Ware says. "The mold [was] inside the Chain-Vey system, which means the entire system [needed] to be dismantled, cleaned, and resealed before we [could] order bulk grain again. For us it comes down to closing the malt intake every time we use it; otherwise rainwater can get in the system."

Ware did overcome the mold issue, but at considerable expense. Until a local company was able to clean the entire system, his brewing team had to go back to lugging bags of grain around. Now that he's dealt with it, Ware says he isn't likely to run into mold trouble again. With the benefit of hindsight, he says that his situation could have been avoided and that he's learned not to cut corners when installing bulk-malt storage.

Overall, when it comes to handling and storing malt, there's a larger lesson that should be easy for any brewer to remember: Preventing problems is almost always cheaper than resolving them.

BREWING INGREDIENTS

# Under the Microscope: Clean Brewing with Kveik

Yeast labs are enjoying sales success with clean kveik strains since their ability to ferment lager-like beers in much less time has obvious appeal. Besides reduced costs and climate impact, they are potential game-changers for hotter climates worldwide. **BY DON TSE**

**LANCE SHANER, COFOUNDER AND OWNER** of Omega Yeast, was at the Ohio Craft Brewers Conference in 2019 when one of his customers handed him a beer. It was a nice, crisp, refreshing lager—or so he thought.

As it turned out, that "lager"—brewed by Chris Helderman, production manager at Land-Grant Brewing in Columbus—was fermented by Omega Hornindal Kveik. Since their introduction to the modern, mainstream brewing world, kveiks have become popular for their quick fermentations at high temperatures, but also for the fruity esters they produce. A clean, lager-like beer made from kveik was an eye-opener for Shaner.

As a relatively small yeast supplier, Omega prides itself in providing interesting yeast strains to creative brewers. So, the kveik "lager" got Shaner's creative juices flowing. "It gave us the impetus to look for even cleaner results," he says. "We wondered if we could isolate a strain that could offer the fast, high-temperature fermentations provided by kveik, while producing a clean, lager-like beer."

"Hornindal is a blend of nine strains," Shaner explains. "We brewed a split batch of beer and tested all nine strains." The cleanest of those nine strains is now Omega's Lutra, which ferments pseudo-lagers in as little as two days at up to 95°F (35°C). In comparison, Helderman brewed his with Hornindal at 75°F (24°C). Yet Lutra (available in both liquid and dried form) produces an even cleaner beer at a significantly higher temperature.

## EMBRACING NEUTRALITY

Nashville-based Bootleg Biology is always looking to be different. After somebody handed chief yeast wrangler Jeff Mello a bottle of traditional Norwegian beer at a festival in Amsterdam, the Bootleg team propagated yeast from the bottle dregs and isolated the various strains, looking for something unique.

"It was kind of a disappointment," Mello says. "It was very neutral. Our goal was not lager. It was hazy IPA. And this yeast wasn't going to be good for that."

However, Bootleg decided to embrace that neutrality. They tested one of the strains for making a clean, lager-like beer—and it worked surprisingly well.

"It felt like we had lightning in a bottle," Mello says. "We are small, but we have received a huge positive reaction. The results speak for themselves." Sales of Bootleg's clean strain, dubbed Oslo, have been as quick and hot as a kveik fermentation.

## GROWING POPULARITY IN NEW MARKETS

The dried yeast supplier Lallemand's kveik is called LalBrew Voss. Selected from 19 strains isolated from kveik provided by a Norwegian farmer, Voss was launched in late 2019. It's already one of the company's top-five best sellers.

The company selected the yeast because it works well with biotransformation and dry hopping, important to hazy IPAs and their tropical aromas. However, in the absence of high-oil hops, Voss ferments relatively cleanly. However it's used, as a durable dried yeast that enjoys warm temperatures, the strain is a game-changer.

"This yeast is disruptive," says Mariano Tissone, the South America regional sales manager for Lallemand. "It is counterintuitive to ferment between 35°C [95°F] and 40°C [104°F]. But this yeast is very popular in tropical climates."

Tissone lives in Argentina, where temperatures in the northern part of the country can exceed 100°F (38°C). For brewers living in such climates around the world, fermenting with temperature-tolerant yeast has obvious appeal. Indeed, Voss has been a quick seller in some surprising places.

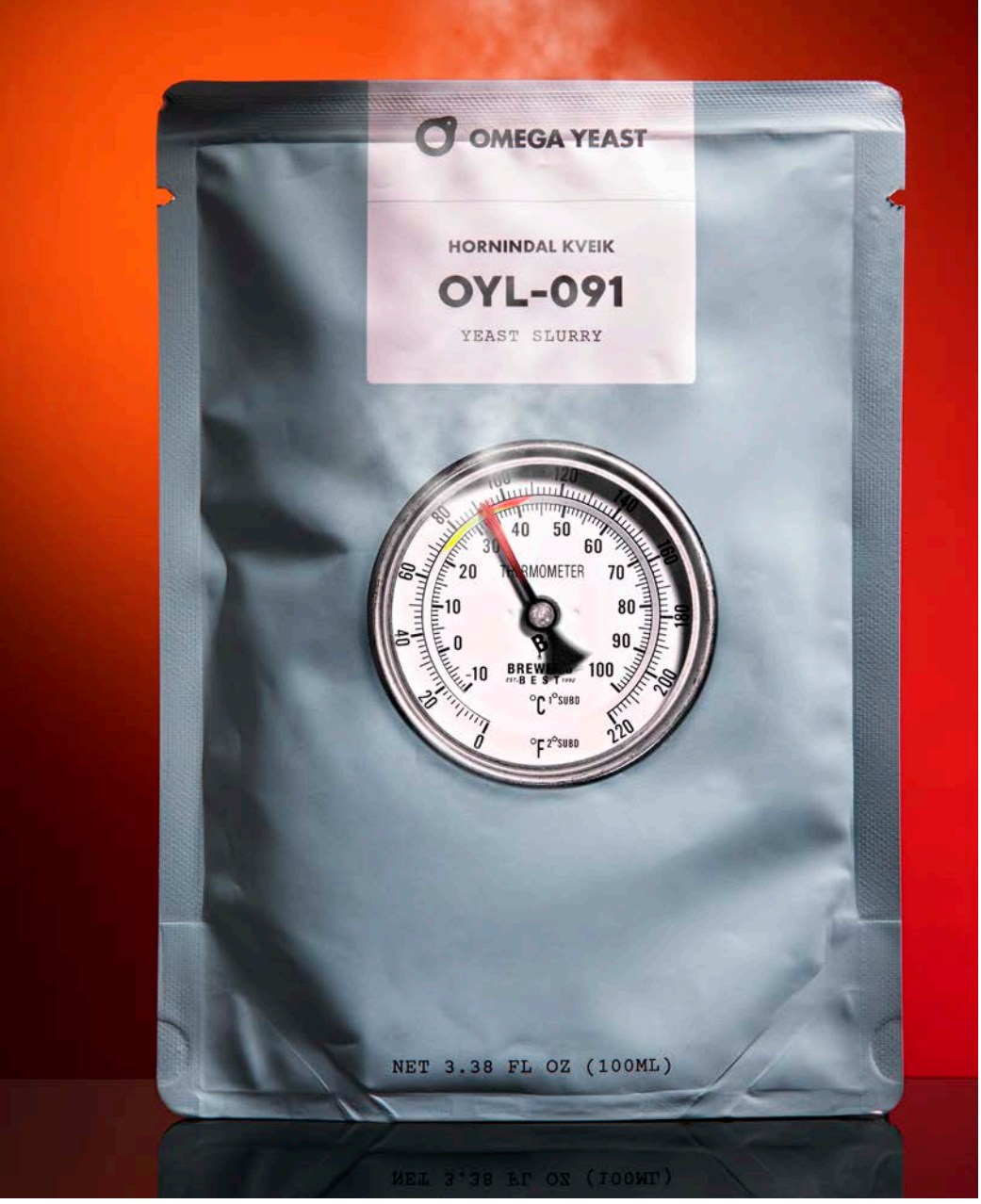



PHOTO: MATT GRAVES/WWW.MGRAVESPHOTO.COM

## BENEFITS OF KVEIK

Among brewers, there is disagreement about whether these clean kveik beers or pseudo-lagers can really match a properly brewed lager in quality and character. There is also a discussion to be had—perhaps involving ethics, transparency, philosophy, and tradition, plus chemistry—about whether a kveik-fermented beer should be sold as "lager."

However, kveik's temperature tolerance and quick turnaround have obvious appeal for brewers looking to make clean, lager-like beers. That appeal increases when considering the lower costs associated with energy use, especially in warm places where refrigeration can be disproportionately expensive. The climate impact of such energy use is another factor to consider.

Indeed, considering the increasing costs for raw materials and packaging, kveik fermentation may offer one area where a brewery can save some money. Such savings might include:

- tank space, since fast ferments free up fermentors
- glycol, since little or no cooling is required
- water, since less is needed to chill beer to pitching temperatures post-boil
- yeast, since kveik can easily be re-pitched

At The Dandy Brewing Company in Calgary, Alberta, head brewer Colin Baldner ferments their top-selling Premium Lager using Escarpment Laboratories' KRISPY, another kveik strain marketed to ferment "lickety-split (pseudo) lagers."

It used to take the Premium Lager six weeks to go from mash to package—two weeks to ferment and pass VDK testing, and another four weeks to mature, clarify, and fine. Using KRISPY, however, the beer now ferments in two days. It passes diacetyl testing after one more day and is crystal clear in a week, for a total mash-to-package time of 10 days.

Baldner is understandably enthusiastic about the cost savings, and he says there has been no negative feedback from customers. (Untappd users score it 3.6, highly respectable for a pale lager.) The only issue he reports is an increased cost of $CO_2$. Since the fermentation happens quickly and at higher temperatures, there is less $CO_2$ in solution afterward. However, this is a negligible negative compared to the massive positives.

## HOW TO USE KVEIK

The use of these kveik strains to brew pseudo-lager is relatively new, and each one is a bit different, so brewers will need to learn to work with their specific strain.

At Land-Grant in Ohio, Helderman fermented his Hornindal beer at 75°F (24°C), but Lutra has a tendency to stall at temperatures that "low"—even though it is one of the strains in Hornindal kveik. It performs better at temperatures above 90°F (32°C).

Here's another quirk: These strains tend to drop pH significantly. "You need to create wort with a higher pH to compensate for this," says Baldner in Calgary. "You need to adjust your water chemistry—which, of course, affects mash efficiency and can result in a mineral taste. So, you have to think about where you're adding your water chemicals. You need to go back to brewing basics to figure out how best to compensate for this."

## THE FUTURE OF KVEIK

While the strains from Bootleg and Omega were isolated from kveik and selected for their clean-fermenting characteristics, the one KRISPY strain went through a different process at Escarpment.

Escarpment took a clean-fermenting kveik and used a process known as "adaptive laboratory evolution" to further develop it. Over 60 generations of the yeast, the lab effectively forced the yeast to mutate in the desired manner.

"It's just like what happens when brewers re-pitch yeast: The yeast will adapt to its environment," says Richard Preiss, cofounder and lab director. "But we introduce certain stressors, so the yeast adapts faster and to our direction."

Like the other strains, the result has been a sales success for Escarpment. But they continue to make adjustments. "The original KRISPY became one of our most popular strains in less than a year," Preiss says, "but the new version is better able to ferment maltotriose, so it ferments more completely, resulting in a drier beer."

"We're really excited to apply this technique to new ideas," he says. "There is a ton of potential with this technique." While there is already enthusiasm about these yeasts, they are likely to see more innovations in the years to come.

HOPS INSIDER

# Speaking the Love Language

Relying on the spot market is no reason to accept hops that don't meet your brewery's standards. Here are tips from the hop-sensory pros on making sure you get the traits and quality you need. **BY STAN HIERONYMUS**

**INDIANA'S 3 FLOYDS IS A "HAVE"** when it comes to hop selection, sending a team to the Northwest each fall to select the hops the brewery will use over the next year. Yet in October, director of brewing engineering Todd Haugh echoed a concern often expressed by breweries not large enough to participate.

Although 3 Floyds has contracts for most of its hops, the brewery also plans to purchase some on the spot market, shopping alongside the "have nots." After rubbing and smelling offerings from the 2021 harvest, Haugh spoke honestly about what was rejected: "Some lots are going to show up on the spot market we should not brew with," he said during a Brewers Supply Group (BSG) webinar.

It's no wonder that the "have nots" worry that the hops larger breweries pass up are of lesser quality. "That perception, it is there," counters Juno Choi, craft-beer strategist at BSG. "It's not true."

## GETTING GREAT HOPS FROM THE SPOT MARKET

Farmers around the world harvest more than 250 million pounds of hops a year. There are plenty to choose from after Sierra Nevada, Firestone Walker, Bell's, and even Anheuser-Busch InBev are done shopping.

**FARMERS AROUND THE WORLD HARVEST MORE THAN 250 MILLION POUNDS OF HOPS A YEAR. THERE ARE PLENTY TO CHOOSE FROM AFTER SIERRA NEVADA, FIRESTONE WALKER, BELL'S, AND EVEN ANHEUSER-BUSCH INBEV ARE DONE SHOPPING.**

Below are some ways that smaller breweries can make sure they acquire hops that will make their brewers happy.

- Define what you consider to be a great example of each variety you use. While the amount of information about the essential-oil composition in a particular lot continues to expand, getting to know a hop still centers on sensory evaluation. Setting up a sensory program involves an investment, but it can protect an already substantial one. For example, BSG contracts Citra at $15.75 a pound, and sixty-four 11-pound boxes (704 pounds total) would cost $11,088.
- Communicate with vendors to find hops with the qualities you've defined.
- Assess each lot when it arrives at the brewery and alert vendors when those hops are flawed.

## EVALUATING HOP PELLETS

Much of the romance of selection is "the rub": crushing raw hops with the palms of your hands, rupturing the lupulin glands, and releasing the aromatics. This is how brewers make selections immediately after harvest.

Evaluating pellets takes a bit more preparation. Tessa Schilaty, sensory research coordinator at Yakima Chief Hops (YCH),

PHOTO: MATT GRAVES/WWW.MGRAVESPHOTO.COM

## THE LOVE LANGUAGE

The American Society of Brewing Chemists Sensory Subcommittee compiled 107 unique terms (first and second level) to describe the aroma of hops.

**Fruity—Citrus**
grapefruit, orange, lemon, lime, tangerine, mandarin

**Fruity—Tropical**
mango, pineapple, papaya, banana, lychee, guava, passion fruit, coconut

**Fruity—Berry**
raspberry, strawberry, blueberry, blackberry, concord grape, white grape, gooseberry, black currant/catty, red currant, white wine

**Fruity—Stone Fruit**
peach, apricot, nectarine, cherry, plum

**Fruity—Melon**
cantaloupe, honeydew, cucumber, watermelon

**Fruity—Pomme**
apple, pear

**Floral**
geranium, rose, lavender, jasmine, elderflower, potpourri

**Woody**
pine, resin, cedar, tobacco, sandalwood

**Herbaceous**
black tea, green tea, mint, rosemary, bergamot, dill, thyme, basil, sage, cannabis, skunk, menthol

**Grassy**
fresh-cut grass, lemongrass, green leaves, hay

**Spicy**
black pepper, clove, licorice/anise, ginger, coriander, cardamom

**Sweet Aromatic**
caramel, chocolate, vanilla, bubblegum

**Medicinal**
plastic, rubber, burnt rubber, smoke, petroleum, diesel

**Dairy**
cheese, cream, wax

**Earthy**
musty, soil, marsh, moss

**Vegetal**
onion, green onion, garlic, green bell pepper, celery, asparagus, cabbage

and Tiffany Petra, YCH sensory manager, have outlined the method in a video on their website. Here are the basics.

- Use a spice grinder to create the samples.
- Each sample should be five grams per assessor. Using equivalent sizes is particularly important when comparing the same variety from different lots.
- Transfer each sample into an amber jar. These can be created in advance and stored cold but return them to room temperature before evaluating.
- Review the lexicon that will be used (see "Learn the Language," below).
- Shake the jar to release and mix the odor compounds.
- Take the first smell a few inches away from the nose, logging any aromas.
- Move a little closer, making note of the most impactful aromas.
- Try to use the agreed-upon lexicon, but don't be afraid to describe other perceived aromas.

### LEARN THE LANGUAGE

YCH has created its own hop lexicon, available for download at yakimachief.com. That dictionary of hop aromas is similar to one from the American Society of Brewing Chemists (see "The Love Language," left) so that it aligns with the industry as a whole.

BarthHaas has a different flavor language, with more than 70 descriptors organized into 12 categories. The global hop supplier also sells a hop-aroma standards kit with aroma vials representing those 12 categories.

Schilaty and Pitra created more than 60 reference standards to train YCH panelists. Those focus on what they call minor complexes (such as lemon, lime, and grapefruit) as opposed to major complexes (such as citrus). They use a mix of food-grade compounds from chemical suppliers, flavor syrups, essential oils, and a bunch of other random things to produce the standards.

"We have to get creative," Schilaty says.

Pitra names off the "grocery-store standards" that they like: "Ribena-juice concentrate for black currant, Laffy Taffy Banana for banana, Ivory Bar soap for soapy, canned pineapple juice for pineapple, peach gummy candy for peach, and fresh tomato vines for tomato plant, to name a few. Over the past couple of years, we've vetted dozens of standards, so anyone struggling to find a standard for a specific attribute should contact us directly."

Unlike other lexicons, Yakima Chief's makes onion/garlic (OG) and "dank" their own top-line categories, reflecting the importance, negative or positive, of those aromas in newer American hop varieties.

Using one method to assess onion/garlic, panelists smell vials, or taste beers, containing food-grade chemical standards such as allyl disulfide (garlic) at varying concentrations. "Another is to grind high OG hop lots at different concentrations with no OG hop lots and ask panelists to rank the samples by OG intensity," Pitra says. This requires having sensory data already documented to make the sample selection.

"For a more casual training exercise, we've chopped samples of garlic, red onion, green onion, shallot, chive, white onion, etc. to give panelists exposure to a variety of alliaceous aromas," she says.

Schilaty calls "dank" a nightmare term because it has at least five possible meanings. However, American brewers most often use it to mean "smells of cannabis," and YCH panelists train for it using a vial of cannabis extract. "It made sense for us to use the word to define something that was not represented (in the lexicon)," she says. "We wanted to avoid having the word cannabis appear on our product descriptions, as we do a lot of work internationally with countries where cannabis is both frowned upon and very illegal."

**SCHILATY AND PITRA CREATED MORE THAN 60 REFERENCE STANDARDS TO TRAIN YCH PANELISTS. THOSE FOCUS ON WHAT THEY CALL MINOR COMPLEXES (SUCH AS LEMON, LIME, AND GRAPEFRUIT) AS OPPOSED TO MAJOR COMPLEXES (SUCH AS CITRUS). THEY USE A MIX OF FOOD-GRADE COMPOUNDS FROM CHEMICAL SUPPLIERS, FLAVOR SYRUPS, ESSENTIAL OILS, AND A BUNCH OF OTHER RANDOM THINGS TO PRODUCE THE STANDARDS.**

PHOTO: JAMIE BOGNER

## TALK THE TALK

Chicago's Hop Butcher for The World has grown large enough—the brewery used about 30,000 pounds of hops to produce about 7,000 barrels of beer in 2021—to participate in hop selection, albeit remotely. The selection team also has grown, from three in 2019 to four in 2020 and five in 2021. Going into selection, they know "this is what we're looking for, how you describe it, either good or bad," says cofounder Jude La Rose.

They continue to build on their aroma knowledge base by evaluating every new package of hops when it arrives. "Because we are using Northern and Southern Hemisphere hops, it seems like we are always rubbing hops," he says. "We'll get a spot hop and go, 'What was that? Can we find more of it?'"

They came across lots from the 2021 crop that smelled of smoke ("some chipotle") and asked the supplier—in this case YCH—for additional lots of Mosaic to try. "The next three cuts were knockouts," La Rose says. "They ask what you like. ... We eventually found some great hops." ("This has all the dank," they said.)

The team at Hop Butcher has learned they like qualities in Mosaic that other breweries might reject. "Mosaic wasn't hitting," Rose says. "We were missing diesel. We want that huge fruit, then diesel."

Choi at BSG recalls a similar conversation with Beachwood brewmaster Julian Shrago about the lots of CTZ from which he was selecting. "They were too clean. He wanted some onion/garlic," Choi says.

## BE SYSTEMATIC

Like other suppliers, BSG has its own sensory panel. "We are going to do our own selection. Suppliers can reject lots from growers," Choi says. BSG can refer to its own notes when a brewer receives a lot that doesn't meet expectations.

The first thing a supplier will ask an unhappy brewer is the lot number. "Hopefully, they still have the hops," Choi says. "Ideally, we are dealing with it before it is in the beer." He says it's important for brewers to evaluate each box of hops on its own. "We are going to check our own notes. You want to allow suppliers to address their concerns."

That solution might be as simple as replacing one box with another.

BSG requires that breweries purchase 1,000 pounds of a variety to participate in selection, but the company will write contracts for quantities as small as an 11-pound box. "Some smaller breweries don't know that. They don't realize that contracts can be added to," Choi says. A contract begins a relationship, with BSG or some other supplier.

One aspect of buying hops is a little like ordering wine in a restaurant: Rejecting a bottle because you "don't like the taste" is not as simple as pointing out it is corked. Suppliers would rather deal with expectations in advance. "If a brewer has an idea of what they are looking for, we can talk about that," Choi says. "Not a lot of people understand or do that. We might even be able to provide a sample."

That works best when everybody is talking the same hop language.

"A brewery that is new to hop sensory may not have the bandwidth for [a full-blown program], and that's totally fine," Schilaty says. "We're always encouraging brewers to start small; just opening the bag, giving it a whiff, and jotting down a few notes is a great jumping-off point. You can always build from there."

HOPS INSIDER

# Looking Ahead at Supply & Demand

While hop harvest commences in the Southern Hemisphere, field work is already under way on many hop farms in the North. Here are some things to know about the season to come. **BY STAN HIERONYMUS**

**FROM A BANNER YEAR FOR** Saaz to higher hop prices on the horizon, here are some recent developments likely to affect brewers in the near future.

## OLD WORLD AROMA

For the classic landrace varieties commonly used to produce lagers, the story in 2021 was different from usual. It was a great year for Saaz but a challenging one for Hallertau Mittelfrüh and other German cultivars. The Saaz harvest was particularly surprising after June and July hailstorms hammered about 20 percent of the hop fields in Czechia.

Czech Republic farmers harvested 18.2 million pounds (826,000 kilos) of hops—that's 40 percent more than in 2020 and 34 percent more than the 10-year average. The average yield of 1,467 pounds (665 kilos) per acre was an all-time high. The Saaz variety accounts for 80 percent of Czech production, and the 14.7 million pounds harvested easily exceed the 10-year average of 10.9 million pounds. In addition, the alpha-acid content averaged 4 percent, compared to the 10-year average of 3.1 percent.

That all amounts to good news for brewers who rely on Saaz. Bohemia Hop reports that besides fulfilling all current-year contracts for Saaz, it also will be possible to fulfill postponed volumes from previous crops, thus satisfying additional demand.

In Germany, meanwhile, the weather turned favorable toward the end of the growing season, resulting in average overall yield and alpha acids. However, cold and wet spring conditions followed by high levels of precipitation led to multiple outbreaks of downy mildew. That caused yield losses and negatively affected quality in varieties that are particularly susceptible, such as Mittelfrüh, Hersbrucker, and Tettnanger.

"At the beginning of June, we had to spray three times in two weeks and had a lot of work training new shoots because a lot of them were affected by downy mildew," says Florian Seitz, whose farm sells directly to many American craft breweries. "[I have] never seen that in this intensity."

After harvest, Hopsteiner calculated the average ratio of linalool to alpha acids in several varieties; a lower ratio indicates a lower intensity of aroma. The ratio for 2021 compared to 2020 was significantly lower for Hersbrucker, Hallertau Tradition, Saphir, and Akoya. (They didn't measure Mittelfrüh.)

## CHANGING (IF NOT GROWING) ACREAGE

During a presentation at the American Hop Convention, Brewers Association chief economist Bart Watson made it clear how important draft-beer sales—which have not returned to pre-pandemic levels—are to hop growers.

Watson says that for every share point that goes to package instead of draft, that translates to about 154,000 barrels of IPA not being sold—and, therefore, not being

**FOR THE CLASSIC LANDRACE VARIETIES COMMONLY USED TO PRODUCE LAGERS, THE STORY IN 2021 WAS DIFFERENT FROM USUAL. IT WAS A GREAT YEAR FOR SAAZ BUT A CHALLENGING ONE FOR HALLERTAU MITTELFRÜH AND OTHER GERMAN CULTIVARS.**

PHOTOS: COURTESY NZ HOPS

**IN NOVEMBER, THE EUROPEAN COMMISSION ANNOUNCED THAT IN 2022 IT WILL LIKELY BEGIN RESTRICTING THE MAXIMUM RESIDUE LEVELS OF CERTAIN PESTICIDES, INCLUDING SOME THAT AMERICAN HOP GROWERS USE. FARMERS AND MERCHANTS WHO WANT TO SHIP HOPS TO THE EU—AND PERHAPS OTHER COUNTRIES ADOPTING SIMILAR REQUIREMENTS—WILL NOT HAVE ACCESS TO THE FULL SET OF TOOLS THEY CURRENTLY USE.**

brewed in the first place. That, in turn, translates to a significant amount of hops that will not be needed.

On-premise is the most important channel for hop growers. Worldwide, it fell from 35 percent of volume share in 2019 to 29 percent in 2020. It has begun to recover, but it may take until 2025 to return to 35 percent. Worldwide, acreage of aroma/dual-purpose hops grew from less than 60,000 in 2012 to more than 102,000 in 2017. Acreage has remained at that level ever since, and the same is expected in 2022, including in the Pacific Northwest.

However, when the USDA releases its survey of acres in the Northwest strung for harvest, don't be surprised if acreage of some varieties that have seen double-digit growth in recent years either does not increase or even shrinks.

It's also possible that acreage of Cascade and Centennial may grow. Farmers planted 7,581 acres of Cascade in 2016 but only 4,328 last year. They harvested 5,534 acres of Centennial in 2017 and 2,342 last year. Those were the two most-grown hops in 2017, and their recent reduction in supply may reflect brewers working through excess inventory. Any decrease in acreage of high-impact hops should be due to a similar rebalancing.

## IN DEMAND

Watson also shared the results of the Brewers Association's 14th annual hop survey conducted late last summer. Because it's based on the BA's definition of craft brewers, it does not include all breweries using substantial quantities of high-impact hops. It is also a survey that is dependent on those who participate, and the results are estimates of overall consumption and demand.

The highlights:

- The craft hopping rate, which climbed from 0.92 pounds (417 g) per barrel in 2009 to 1.5 pounds (680 g) per barrel in 2015, has remained relatively unchanged since then. It's projected to be 1.53 pounds (694 g) per barrel in 2022.
- The implied craft usage dipped from 25.5 million pounds (11.6 million kilos) in 2019 to 23 million (10.4 million kilos) in 2020. It is projected to reach 26 million pounds (11.8 million kilos) in 2022. Farmers in the Northwest harvested 116 million pounds (52.6 million kilos) in 2021.
- Forty percent of those surveyed report using downstream products. Converted to pounds by type, brewers used 87.1 percent pellets, 6.7 percent powders and similar products, 3.6 percent oils, and 2.6 percent whole cones.
- The survey of brewers included this question: "If there were one hop you would use more of if you could get a stable supply, what would it be?" The leading answers were Citra (14-plus percent), Galaxy (11 percent), Mosaic (8-plus percent), Strata (7 percent), and Nectaron (5 percent).

## BUMPER NZ CROP AHEAD?

Heading into harvest in March, hop growers in New Zealand were expecting an outstanding crop.

"We experienced a fairly wet spring here in the top of the South Island that developed into a beautiful dry sunny summer," says Lauren Yap of NZ Hops, via email. "It was fairly ideal for hop-growing conditions. These good conditions have been across all of our farms and all four of our micro-regions, and as a result, there is somewhat rising optimism that this 2022 harvest will be a bumper year."

NZ Hops is a cooperative with 27 members that farm 740 hectares (1,828 acres). The dominant varieties are Nelson Sauvin (192 hectares/474 acres) and Motueka (139/375). They will harvest 64 hectares (158 acres) of Nectaron, but they expect its production to surpass Nelson Sauvin and Motueka in 2023. Although acres of Nectaron doubled between 2021 and 2022, let's put those 158 acres in perspective: That's less than 30 percent of Comet acreage in the U.S. Northwest.

Three farms operate at least partially outside of NZ Hops: Hop Revolution, Freestyle Hops, and Clayton Hops. All were expecting a good crop.

"The crop is somewhat better than I expected this year," writes Sean Riley, general manager at Freestyle. "I made the conscious decision to begin training around two weeks earlier in anticipation of a dry summer. That call certainly paid off. Much to my surprise, the Motueka and the Nelson Sauvin performed really well with the earlier train. Riwaka is still doing what it does every other year: continuing to sulk, but coming into its own as the ambient soil temp increases.

"I am expecting a great season. The yields across the board are up, and I am already noticing better aromas than last year."

Clayton Hops, which operates four farms, will harvest 800 acres (324 hectares) this year and 1,200 (486 hectares) within three years. About one third of production goes to NZ Hops, with the rest sold to distributors and brewers worldwide.

The company recently announced it will build its own processing plant, which would become the largest in New Zealand. Clayton previously used Freestyle's pelletizer and this year will use the one at NZ Hops. Both of those facilities can process one ton of hops per hour, while the new one at Clayton will have a capacity of three tons.

Chief executive Brian Clayton says they are discussing a managed partnership of the new facility with NZ Hops. "Both parties recognize the opportunities created for the New Zealand hop industry by this new asset," he says.

## OZ HARVEST READY

Hop Products Australia (HPA) recently completed a new processing facility at its Buffalo River Valley farm in Victoria. It houses two Daunhauer pickers, 12 kiln floors, a conditioning floor, and a bale press. "This will allow us to get across the ground and process all the hops in a timely fashion," says Owen Johnston, sales and marketing manager, in an email.

"We planned appropriately for increased acreage," he says. "As a result, the plant architecture, timing of growth stages, and onset of burr were all within expectations. Early indicators are looking good in the lead up to harvest, and we expect to meet

our average yield forecasts within the normal seasonal variances."

The conditions seem to suit Eclipse, the proprietary hop that HPA released last year. "The fields are looking uniformly green, [and] we're optimistic at this early stage," he says.

Galaxy, which constitutes more than 55 percent of the crop, is also looking consistent from field to field. "The increased processing capacity in Victoria should address concerns about adequately managing the harvest window," Johnston says.

## WHY PRICES MUST GO UP

The pressure on hop prices is not as pronounced as those on malt, but growers must deal with inflationary prices as well as the supply-chain issues that currently affect all farmers. For instance, fertilizer costs skyrocketed last year, although recently they have eased somewhat.

In addition, two regulatory changes will affect production costs in the short and long term:

- Washington state has eliminated the overtime exemption for agricultural workers. In 2022, farms will pay overtime for any time above 55 hours per week, with the threshold dropping to 48 hours in 2023 and 40 hours in 2024. Oregon is considering similar measures—but even if it doesn't, workers can move easily between Northwestern states, and the minimum in one is likely to become the minimum in others.
- During harvest season, 70- and 80-hour work weeks are common. It will be difficult for farms to add a third crew to the two crews typically employed because of the current shortage of agricultural workers.
- In November, the European Commission announced that in 2022 it will likely begin restricting the maximum residue levels of certain pesticides, including some that American hop growers use. This is part of the European Union's Farm to Fork strategy to reduce overall risk and chemical-pesticide use by 50 percent by 2030. Farmers and merchants who want to ship hops to the EU—and perhaps other countries adopting similar requirements—will not have access to the full set of tools they currently use. Making adjustments likely will come with additional costs, ultimately affecting the price of hops sold in the United States.

HOPS INSIDER

# Hops for the Future

What does it mean when a hop farm gives up on Cascade? In this first installment of a series focusing on the long-term outlook for hops—and issues likely to affect brewers beyond 2022—**STAN HIERONYMUS** considers hop stunt viroid, as well as the future of the hop upon which American craft was built.

**AT DOUBLE R HOP RANCHES** in Harrah, Washington, operation manager Jessica Riel made it official last fall that the farm had harvested its last crop of Cascade.

"We're throwing in the towel," she says.

Double R began growing Cascade in 1975, four years after the USDA released it to farmers and well before it would become an essential ingredient at thousands of small breweries. A year after the Hop Quality Group created the Cascade Cup competition in 2013, Double R tied for second runner-up. The decision to pull the last 35 Cascade acres—down from a peak of 150—out of the ground was not an easy one. However, it was practical because of hop stunt viroid (HSVd), one of many diseases that may reduce the quality and yield of hop plants.

"We have unfortunately not been able to successfully replant Cascade and maintain a healthy yard that doesn't succumb to [HSVd] in the first [few] years," Riel says. The last field of them was only four years old. "It was planted from virus-free root stock. We did have a decent yield the first couple of years. Certainly, by Year Three and here in Year Four, we saw such a yield reduction and a quality reduction."

The Riel family is not suggesting that Cascade is in danger of disappearing. Farmers in Washington, Oregon, and Idaho harvested 6.9 million pounds (about 3.1 million kilos) of it in 2021. "We can get exactly what we need," says Tom Nielsen, R&D and raw materials manager at Sierra Nevada. No other brewery in the world uses as much Cascade in a single brand as Sierra Nevada uses in Pale Ale.

For the most part, the industry knows how to manage the disease. Overall, Nielsen says, "the worry is no longer there." He pauses before adding that it can be "more of a worry for growers of Cascade."

When a family farm in business since 1945 struggles to grow a variety that its members have known for more than 40 years, there are lessons that brewers may want to learn.

## LOWERING YIELD

As its name suggests, hop stunt viroid may cause stunted growth and delay climbing to the top of the wire. It was first identified in hops in Japan and has been prevalent there since 1970, with grapevines the likely source. Since then, it's been found in several other hop-growing regions, including Washington state since 2004. The sample size was small, but 15 percent of plants collected were found to be infected.

Cascade is not the only variety that suffers, but the impact on different cultivars varies. Some show few symptoms, and their growth is not seriously reduced. Others may suffer yield losses of more than 60 percent. During a five-year study comparing six varieties, reported online in 2017 by APS Publications, HSVd reduced the yields of infected Glacier, Willamette, and Cascade by 62, 34, and 14 percent respectively. The alpha- and beta-acid contents of Glacier and Willamette also were reduced, while Cascade's were unaffected. The study observed no significant yield reduction for Nugget, Columbus, or Galena.

That study also included a survey of 20 different varieties collected in the three major growing regions of Washington, revealing that 17 percent of hops were infected and that all 20 cultivars could be infected. Researchers reported that although some varieties were asymptomatic, they could not determine the impact of the infection on their brewing qualities.

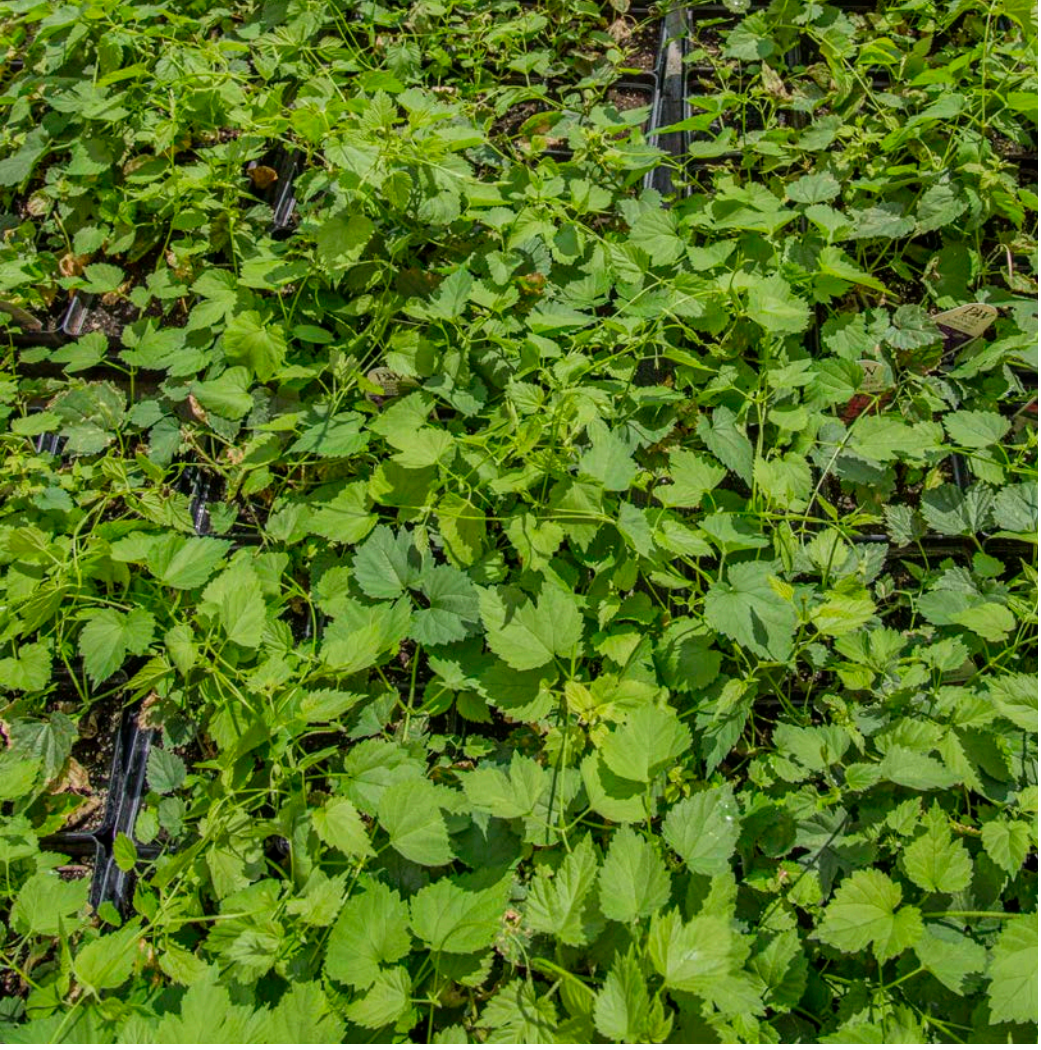
## PREVENTING THE SPREAD

Farmers discovered centuries ago that the most efficient way to propagate new hop plants is by taking cuttings from rhizomes. It is more economical for farmers who want to replace a few worn-out plants in a field or expand acreage of an in-demand variety to subdivide their own rhizomes than to purchase them.

Unfortunately, that is also the best way to spread HSVd. It can also be found on farms when farmers purchase HSVd-infected planting stock from third-party propagators. It is not transmitted through the air (like powdery mildew) or by aphids (like hop mosaic virus). Once in a hop yard, it spreads via mechanical means such as mowing, leaf stripping, and cutting tools.

Because it may take multiple seasons before obvious symptoms of disease appear, propagation of infected plants is common. Planting material known or certified to be free of HSVd is the first line of defense. The second is following proper protocol in the field.

**"WE HIT A WALL. YOU'D HAVE ONE HOP BINE THAT WAS FINE, AND THE PLANT NEXT TO IT WAS HALFWAY UP THE WIRE. MATURITY WAS UNEVEN, FIELDS WERE TOUGH TO PICK. YOU GET UNHEALTHY PLANTS, AND THEY ATTRACT MORE PROBLEMS."**



Hops awaiting planting.

PHOTO: JAMIE BOGNER

## A CLEAN START

For most hop farmers, starting with certified-clean, virus-tested plant stock means acquiring stock from a propagator using indexed stock from the Clean Plant Network. Yakima Chief Ranches operates on a different scale. The company's new headquarters in Zillah, Washington, is a multipurpose facility that includes spacious laboratories and a plant-tissue culture room as well as an adjoining propagation nursery. The tissue-culture lab can produce thousands to hundreds of thousands of clean plants each growing season.

Three hop-farming families—the Carpenters, Smiths, and Perraults—formed Yakima Chief Ranches in the late 1980s. YCR specializes in breeding new varieties. In 2003, YCR and the John I. Haas breeding programs merged to form the Hop Breeding Company. Four of the seven leading cultivars grown in the Northwest are HBC or YCR releases.

"We are going to have viruses and viroids no matter what," says Ryan Christian, YCR technical director, listing several currently on his radar. "We've doubled down on our testing." That means testing plants before they are used for propagation and throughout the propagation season, assuring that the stock released from the Zillah nursery will be virus free.

The lab also monitors experimental varieties for pathogens as they advance through the breeding cycle. A potential new variety that's infected won't automatically be discarded. It may have other attractive qualities that can be cleaned up in tissue culture, and this assures breeding stock remains clean.

Not every viroid is a cause of great concern. In 1990, hop latent viroid was detected in mother plants at the Horticultural Research Department of Hops Research at Wye College in England. Circumstantial evidence suggests it was established in the propagation system in the 1970s. Hop latent viroid is thought to be ubiquitous in the United States and shows no visible symptoms in most cultivars, although it may suppress yield in some.

## COST-BENEFIT ANALYSIS

A recently published study in *HortScience* is the first to examine the economic impact of HSVd over a six-year production cycle, as well as the potential benefits of using certified-clean plant stock. Economists at Cornell University worked with representatives of the Clean Plant Network and with hop growers to create a model that, with some modifications, also works for other plants and diseases. They reached the following conclusions.

- The impact of hop stunt ranged from $432 (with 1 percent reduction in yield) to $26,795 (with 62 percent reduction) per acre over the production cycle.
- Using a net present value approach, the study analyzed the potential economic benefits of using certified disease-free planting stock. If expected yield losses exceed 6 percent for hops appreciated primarily for their aroma or 7 percent for hops used for bittering, then the value of investing in certified-clean stock is greater.
- Complete removal and replanting of an entire acre with certified-clean stock is economically beneficial once expected yield losses exceed 35 percent (aroma) or 36 percent (bittering).

If anything, this model is conservative, making it particularly useful for hop growers outside the Northwest who are less likely to be aware of HSVd or how devastating it can be.

## THE BOTTOM LINE

Double R Ranches hasn't necessarily given up on Cascade.

"We are open to growing it again in the future, but we hope the industry can learn more about [HSVd] ... and how to prevent the spread before we attempt it again," Riel says. "There are other varieties [in which] it can impact yield, but it is really Cascade that is most at risk."

She doesn't hide the frustration. She says that she and her father, Double R president Kevin Riel, have been talking about it for years. "I feel like it is not completely understood—that there are [elements] we really can't explain," she says.

"We hit a wall. You'd have one hop bine that was fine, and the plant next to it was halfway up the wire. Maturity was uneven, fields were tough to pick. You get unhealthy plants, and they attract more problems."

She also makes it clear that the problem isn't universal. "There are original Cascade fields that are perfectly healthy," she says. "The reason we brought this up is I know it has been hard for brewers to forecast. But they need to contract, to send the market a signal to make sure [Cascades] are available. Otherwise, we could lose healthy fields."

BEYOND BEER

# Bubbling Up: Hop Water Is on the Rise

In demand and on trend, hop water is proving to be a low-effort, high-reward offering for many small breweries. **BY KATE BERNOT**

**JON EAGER IS HIS OWN** hop-water customer. He and the other brewers on his team at Indeed in Minneapolis had long lobbied to create a nonalcoholic… *something*.

"A number of us had been at Indeed for years, and you can't keep drinking beer like it's the first year you opened," says Eager, the company's R&D brewer.

He also saw white space in the brewery's taproom: Most of Indeed's beers came in about 5.5 percent ABV, with hoppier styles in the 6 to 8 percent range. A typical tab for a customer is only a couple of beers—unless Eager could create what he calls a nonalcoholic "session extender."

As interest in nonalcoholic (NA) drinks grows, small breweries are looking for products to serve existing customers and potentially attract new ones. In October 2021, NielsenIQ surveyed drinkers of NA beer, wine, and spirits; 78 percent said they also buy alcoholic drinks. It's not only teetotalers who are looking for NA options, but breweries' existing customers, too. Also, because NA beer tends to be difficult and expensive to produce in a high-quality form, many breweries are bypassing that option in favor of a product that's high-margin and relatively low-effort: hop water.

"It's so easy," Eager says. "It's so inexpensive. And it scratches the hoppy beer itch—it really does."

Indeed's Hoopla Hop Water has sold quickly in its two taprooms, and the brewery is considering canning the product for distribution. Whitestone Brewery in Cedar Park, Texas, says it sells 55 to 65 cases of its HopWater per week, up from just five cases per week when it launched in March 2021. At 3 Sheeps Brewing in Sheboygan, Wisconsin, Hop Water has become a popular taproom order after its launch three years ago.

National products such as Lagunitas Hoppy Refresher and Sierra Nevada's new Hop Splash are blazing the hop-water trail in terms of consumer, distributor, and retailer education. For the 26-week period ending January 1, the Lagunitas version sold about $1.8 million nationally in chain retail stores, per Nielsen data. That's an increase of 28 percent over the previous year. Many smaller breweries now see the opportunity to introduce their own local versions.

Here are tips on how to get it right.

**"I LIKE THAT IT GIVES PEOPLE WHO COME TO OUR TAPROOM A DIFFERENT EXPERIENCE OF BREWING INGREDIENTS. THEY'RE GETTING A STRAIGHT APPRECIATION OF WHAT HOPS TASTE LIKE."**

## RECIPE & RESEARCH

Like a BLT sandwich, there's not a lot that goes into hop water, so each element has to be pristine.

For its HopWater, Whitestone dry hops with four pounds per barrel of whichever "classic C hops" it has in abundance, then finishes it with a small amount of raspberry and lime concentrate.

At 3 Sheeps, brewers use whatever hops they might have in surplus, adding them to the brewery's Hop Water in the whirlpool stage at a rate of 1 pound per barrel. Brewmaster and co-owner Grant Pauly says he's especially fond of Amarillo, Citra, and Sorachi Ace in hop water and that he tries to


PHOTO: COURTESY INDEED

choose hops with alpha-acid content below 11 percent. He adds them to the whirlpool at just 140°F (60°C) for 30 minutes, which he says draws out only a few IBUs.

Pauly also chooses to keep the carbonation rate lower than a hard seltzer—more in line with beer levels—because carbonic acid can amplify that bitterness. Meanwhile, in Texas, Whitestone says it dials up the bubbles on its HopWater, above what other breweries might do, because its customers in Texas are used to Topo Chico mineral water's high carbonation levels.

In Minneapolis, Indeed dry hops with 1¼ pounds per barrel of Sultana and Mosaic; no hops touch the water on the hot side. Eager says that even adding them in whirlpool is enough to isomerize the oils and contribute unwanted bittering units. However, he says he's running some whirlpool trials using Hopsteiner's Salvo oil product, which contains no alpha acids.

The biggest challenge may be in ensuring a shelf-stable product if and when a brewery is interested in canning it. Without alcohol to inhibit bacterial growth, sanitation is critical. Eager runs a caustic cycle on tanks before making a batch of hop water, even if they have previously been cleaned. Every piece of equipment that transfers the hop water from the brew system to the fermentor also gets cleaned, sanitized, and heat-treated.

Shelf stability also requires bringing the pH between 4.4 and 4.6, Eager says, enough to inhibit bacterial growth. He achieves this by spinning Hoopla HopWater through a centrifuge—though it doesn't need it for clarity's sake, only to remove micro solids—and adding citric acid. In his bench trials, a dilution of 0.12 percent citric acid in a 100 ml sample put him in the desired pH range. However, when he went to full batches, naturally occurring carbonic acid brought the pH so close to its target that Eager barely had to add citric acid at all.

Sending water from the kettle through a heat exchanger and blasting it with $CO_2$ lowers oxygen levels, but it also adds carbonic acid—some of which is still in liquid form, lowering the pH, similar to what happens when spunding. "It was kind of an 'aha' moment when that happened because if you have the right processes, you barely need to adjust your pH at all," Eager says.

Rhett Wright, senior sales representative at Whitestone, says their HopWater has been a no-brainer addition to the lineup. "It's a beautiful product," Wright says. "It's relatively easy to do, and it doesn't tie up tank space. And it serves more than one consumer because it's also so incredibly mixable with your favorite spirit."

## MAKE IT FUN

Whitestone's website advertises the brewery's HopWater as zero calories, zero carbs, zero sugar, zero alcohol—and "mixable A.F."

Wright admits that when he first began meeting with retailers about HopWater, he was naïve about the number of moderation-minded or "sober-curious" drinkers. He's since realized that HopWater customers are buying it for a variety of occasions: to replace a beer, to drink instead of a LaCroix, or to mix with liquor.

The versatility of the beverage is reflected in where stores shelve it. Sometimes, Whitestone's HopWater is in the beer cooler, sometimes in the canned-water section, sometimes with mixers such as club soda, and sometimes cross-merchandised with liquor brands at Total Wine or other large stores. It's typically priced at $6.47 per six-pack of 12 oz cans. That's about the same price as market leader Lagunitas Hoppy Refresher, except that comes in four-packs of 12 oz bottles, giving Whitestone's HopWater a value boost. (At Indeed's taproom, Hoopla HopWater sells for $3.50 for a 12 oz tulip; 3 Sheeps charges $3 per pint in its taproom.)

The wide appeal has opened up on-premise sales opportunities, too, even if 95 percent of Whitestone's HopWater sales are in grocery and liquor stores, according to Wright. Bartenders at Austin bars including Prim and Proper and Hops & Hounds have used it as a cocktail mixer; others serve it as a standalone NA option. Whitestone also is partnering with an alcohol-free bar to participate in two pop-up events during this year's South by Southwest music and culture festival.

"I just don't see this going away," Wright says. "We do know there are other brands coming. We know that our buyers in the stores absolutely love it. I think this is something that's going to keep growing."

Pauly says that Hop Water has been a great way for 3 Sheeps to serve an NA product that's made in-house and still fits squarely within the craft-beer realm.

"I like that it gives people who come to our taproom a different experience of brewing ingredients," he says. "They're getting a straight appreciation of what hops taste like."

**Hear Here!**

For more from Bret Kollman Baker on brewing tart fruit beers, listen to Episode 165 of the *Craft Beer & Brewing Magazine*® podcast.

**beerandbrewing.com/podcasts**

CASE STUDY

# URBAN ARTIFACT

From a 19th-century former church in Cincinnati, **URBAN ARTIFACT** is building a national reputation driven by heavily fruited, tart (and shelf-stable) beers and direct-to-consumer sales. **BY KATE BERNOT**

**CINCINNATI'S URBAN ARTIFACT** learned the art of the pivot years before the rest of the world was forced to do it. Not long after opening in 2015, the brewery's leadership learned that the long-fermented, barrel-aged, mixed-culture beers on which they had based their business just weren't selling the way they'd hoped. In fact, those beers were hardly connecting with drinkers at all.

"People didn't like *Brett* beers," says Bret Kollmann Baker, cofounder and COO of Urban Artifact. "They didn't like *Brett*-flavored things. We spent a long time perfecting using *Brett* in our brewery, and now we don't do any of it."

Instead, the brewery doubled down on what drinkers *were* excited about: fruit. Today, Urban Artifact is one of the country's best-known producers of heavily fruited, kettle-soured beers—and better yet, they're the kind that don't explode on shelves because the fruit ferments out fully. Honing this specialty has propelled the brewery to more than quadrupling its production between 2016 and 2020, finishing last year at 10,200 barrels. Distributed around Ohio, the beer also ships directly to fruit-beer enthusiasts in 10 states, building the brewery's national reputation.

"That popularity certainly extends beyond just a cult following," says David Nilsen, a beer writer, observer of the Ohio beer scene, and certified Cicerone who lives near Dayton. "They are being very strategic with positioning … to where they aren't dependent only on beer geeks to like their beer."

Because of this stylistic focus, the Urban Artifact taproom isn't necessarily the kind of place where the whole neighborhood gathers to watch a baseball game. However, somewhat counterintuitively, zeroing in on one beer specialty has expanded Urban Artifact's customer base to drinkers who wouldn't otherwise be beer fans. Because the beers are so fruit-forward, they appeal to more people in a way that cocktails, kombuchas, or even juices might.

"It's ease of flavor and understanding," Kollman Baker says. "You don't need to know what a raspberry sour ale is to know what it's going to taste like. You've got to know what a Munich helles is, and what those words mean, to know what that taste experience is going to be like. So this barrier to entry is a lot lower, which helps."

## PEACH, LOVE, AND UNDERSTANDING

The decision to lead with fruit flavors and tartness was partially informed by sales numbers, partially from taproom feedback, and partially from every brewer's frenemy: Untappd reviews.

The Urban Artifact team jokes that Kollman Baker spends an unhealthy amount of time with Untappd reviews. Yet reading direct customer feedback has taught the brewery not only what customers rate highly, but also how they describe it.

Acidic beers are still uncharted territory for many drinkers, both in terms of flavor and the language attached to the sensory experience. Drinkers sometimes describe a beer as sweet, when in fact they're just picking up on the use of vanilla, for instance. Sometimes they describe the perception of a lot of fruit flavor as sour, even if it's actually adding sweetness to the beer.

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PHOTOS: COURTESY URBAN ARTIFACT


Saint Pius X

**"WHAT WE'VE COME TO LEARN IS THAT IF YOU SAY 'SOUR,' PEOPLE EXPECT A HIGHER INTENSITY LEVEL, WHEREAS IF YOU SAY 'TART,' THEY EXPECT MORE BALANCE, AND [THEN] PEOPLE ARE USUALLY MORE WILLING TO GIVE IT A SHOT. FROM A MARKETING PERSPECTIVE, WE'VE BASICALLY PIVOTED ENTIRELY AWAY FROM THE USE OF 'SOUR' AT ALL IN ANY OF OUR COMMUNICATIONS, BRANDING, MARKETING, AND IT'S ALL 'TART' NOW."**

level, whereas if you say 'tart,' they expect more balance, and [then] people are usually more willing to give it a shot," Kollman Baker says. "From a marketing perspective, we've basically pivoted entirely away from the use of 'sour' at all in any of our communications, branding, marketing, and it's all 'tart' now."

For chief brand officer Scott Hand, feedback tools such as Untappd are a way to gauge whether the brewers' intent in creating a specific beer translates to the final product. Because Urban Artifact's success is based on its ability to deliver both exciting and familiar flavors in beer form, the lines of communication need to be clear.

Untappd "is usually a very quick measure of how well we managed expectations of the flavor profile," Hand says. "We are still exploring the boundaries of the niche that we set. … We're moving toward a refinement stage of what balanced fruit beers taste like and are presented as."

So far, drinkers have been enthusiastically along for the ride.

"Even though they are niche and not everyone loves sours, Urban Artifact is always mentioned as one of the best breweries in Cincinnati," says Jason Parnes, co-owner of Higher Gravity Crafthaus, a bottle shop and bar across the street from the brewery. "That's hard to do when you focus on only one style."

## SECURING FUTURE FRUIT VIA CONTRACT

Pandemic-era supply chains have not been kind to fruit-focused breweries, and Urban Artifact is no exception. The brewery almost always uses whole fruit for its beers, painstakingly removing small seeds and leaves. That's part of the brewery's value proposition: Premium sour beer no longer means barrel-aging or spontaneous fermentation for Urban Artifact; it means exotic and whole ingredients.

"If we're going to do a high-end fruit beer that's not barrel-aged, then we're going to buy whole fruit," Kollman Baker says.

Thankfully, pricing is beginning to relent from its highs last year, he says, because harvest 2022 is on the horizon. Suppliers are still sitting on fruit from last year's crop, since high prices decreased demand, and now they're finally lowering prices to sell through it. Urban Artifact is seeing prices for a pound of raspberries in the $2.50 range rather than last year's high in the $3.50 range.

To hedge against such price fluctuations in the future, the brewery last fall began leasing land from Pacific Northwest farmers to contract specific fruits exclusively for Urban Artifact. That gives the brewery guaranteed access to difficult-to-find fruit such as golden raspberries, saving it from scrambling on the spot market. Previously, Kollman Baker had considered leasing fields from a nearby farmer in Ohio and growing the brewery's own fruit, but he realized he didn't have the manpower or expertise to make it work at scale.

"Aside from just getting exotic berries and fruit, the lease will really help us establish and build trust with farmers and hopefully enter into more long-term contracts and get guaranteed supply," he says. "If you buy from an aseptic fruit supplier, you don't know what you're getting. … I'm able to get more specific with what varietal fruits I want. It's not just strawberries; it's 'I want evergreen strawberries from the Pacific Northwest,' or 'I want this Turkish variety.'"

In the past, Urban Artifact also has worked with foragers to collect wild pawpaws and brewed with a Brazilian fruit called yellow mombin (also known as hog plum)—possibly the first U.S. brewery to make a beer with that fruit. Tart fruit beer may seem like a narrow lane, but it encompasses a wide spectrum of flavors, aromas, and possibilities—limited only by how many physical fruits brewers can source.

## FAR AND WIDE

Tart fruit beer is still a niche, and there are inevitably a limited number of Ohioans who love them—as Urban Artifact knows well. When the brewery opened, hometown favorites Rhinegeist and MadTree already were brewing a wide range of styles. What Urban Artifact aimed to do was brew the best fruit beer not just in town, but in the country—and to bring it to drinkers anywhere who wanted it.

Currently, the brewery ships directly to consumers in 10 states. About half of those DTC sales come from its monthly subscription club, the Small Batch Society. That club has proven to be not only a sales channel; it's also been an outlet for Urban Artifact's brewers to flex their creativity without worrying about whether the beer will sell on shelves through distribution. The subscription club used to include variants on beers that Urban Artifact brewed on a larger sale, but members nudged the brewery toward more exclusive and experimental beers. That suits the brewers just fine, giving them a reason to push the envelope to create club-exclusive beers.

This year, the brewery winnowed its total number of beer releases for distribution in half. Now, the Small Batch Society is giving the brewing team a place to continue experimenting while also satisfying customers who might otherwise miss that variety.

"The small-batch, 10-barrel beers can still help fit that variety that the core Urban Artifact fans are looking for," says Scotty Hunter, CFO and head of sales. "The other thing we're doing is hoping states pass more DTC legislation. … I'll continue to try to push brewers to stop being traditionalists [by thinking] that it will somehow hurt their business."

Hunter and the rest of the team admit they're still fine-tuning their digital marketing efforts to reach more new drinkers outside of Ohio. So far, however, word of mouth has done a lot of the heavy lifting—a testament to how well the brewery has embraced its orientation toward heavily fruited beers. What felt like a necessary pivot has become a strong identity, and one that drinkers can't seem to get enough of.

"They're still Urban Artifact," says Nilsen, the Ohio beer writer. "The people behind it still put their personality into it. They've done a really good job of creating an identity within the market, even while some of the accoutrements of that identity have had to radically shift."



The brewery pasteurizes fruit purée in-house rather than purchasing aseptic purée, which gives them more control over the flavor of the fruit and varieties of fruit they can use.

**CLOCKWISE FROM TOP:** Brenda Gómez, Esthela Davila, Carmen Favela, Sam Olson, and Sandra Lambarri; Micheladas are a customer favorite; two views of the front patio show how it's set up perfectly for outdoor community events and live music.

CASE STUDY

# MUJERES

Undeterred by the pandemic, the women of **MUJERES BREW CLUB** in San Diego transformed their beer-education group into a full-fledged cooperative brewery. Now, their goals to educate, empower, and employ women in beer are more valued than ever—and it's a model that could work anywhere. **BY BETH DEMMON**

**IN SPANISH, *MUJERES* MEANS "WOMEN."** And in the bustling Mujeres Brew House, next to coastal Interstate 5 and practically in the shadow of San Diego's iconic Coronado Bridge, it's women who are running the show.

Mujeres cofounder Carmen Favela says they employ about a dozen staff members, all of them female. Most identify as Hispanic, Latina, and/or Chicana; that also reflects the surrounding Barrio Logan community, where almost three-quarters of residents are of Hispanic descent. It's a tight-knit neighborhood, Favela says, where residents have an unusual ability to band together and oppose threats such as gentrification or pollution from the nearby shipyard.

That's why it was crucial for Mujeres to get—and now maintain—buy-in from its neighbors.

"The community has welcomed us," Favela says. "The community loves the space. And it needed a space like this. … Yesterday, I got a call, and the lady [says], 'I love your place, I can bring my kids with me, and I feel comfortable.' It feels great. I can't say that I feel like that about any [other] brewery in San Diego."

Mujeres is a rare example of a brewery that embodies the ideals of "community" as a top priority, rather than simply spouting it as a buzzword or optional bonus. As San Diego's first Latina-founded and women-led community brewery and beer club, their first year in an established space proved that where there's a will, there's a way.

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## AN AMBITIOUS IDEA

Mujeres Brew House was originally Mujeres Brew Club, a women-centric beer-education group that met every month at nearby Border X Brewing starting in 2019.

Founded in 2013 by Favela and her husband David, Border X was the first brewery in Barrio Logan. It focuses on Mexican-inspired flavors for their portfolio of rotating brews. Bestsellers such as their Blood Saison, brewed with hibiscus and agave, and their Horchata Golden Stout helped set them apart in a sea of IPAs. Their vision to bring craft beer to the barrio married two cultures in a way that San Diego had never seen, much less accomplished.

The Brew Club began as the notion of Favela and Esthela Davila, a Barrio Logan native and cohost of the Indie Beer Show podcast. They wanted to create a space for women to connect with one another and learn about beer in a comfortable, inclusive environment—one where men were welcome but not in charge. Border X's sprawling outdoor patio was the most obvious venue. They held their first meeting in May 2019, expecting just a handful of attendees. At least 60 people showed up instead, and attendance never slowed down.

Then came the pandemic.

PHOTOS: VITO DI STEFANO


LA CASA VERDE
MUJERES BREW HOUSE
MUJERES BREW HOUSE
MUJERES BREW HOUSE


MUJERES BREW HOUSE

The club faced a choice not unlike that faced by small hospitality businesses: Continue or close. They chose to continue, but despite everything, they chose to take their initiative further. In the summer of 2020, Esthela noticed a vacant brewhouse previously occupied by now-defunct Alta Brewing, less than half a mile from Border X. She casually mentioned to Favela that it would be the perfect spot for the club to expand. It had the tanks, and it had the space.

By the end of the week, it had new tenants: Mujeres, which was preparing to go from club to business.

## DRAWING NEW CUSTOMERS THROUGH CULTURE

Like a true cooperative, the Mujeres members jumped into action. They hosed down the brewhouse, dusted the bar, cleaned the lines, and did whatever was needed to open their doors. Since they launched the business during the pandemic, Mujeres was not eligible for Paycheck Protection Program (PPP) funds. However, once they established a business plan with Border X's financial backing and acquired a space of their own, they found that the pandemic could only slow their momentum—and there were advantages to that.

They opened in November 2020. "It was basically a soft opening," Favela says. "We couldn't have any gatherings, so we couldn't really have an 'official' grand opening." Eventually, they were able to throw an outdoor grand opening in June 2021. Meanwhile, after their accelerated timeline to open their doors, slowing down their rollout proved to be beneficial.

The takeover of Alta's brewery included their small Premier Stainless brewhouse plus four 10-barrel fermentors, one 10-barrel brite tank, and a Meheen 22 oz bottling line formerly owned by Alpine Beer. Initially, Mujeres borrowed brewers from Border X, but in August 2021, Samantha "Sam" Olson officially joined as head brewer following stints around San Diego brewhouses including ChuckAlek, Fourpenny House, 13 Point, and Bivouac Ciderworks.

Olson has embraced the opportunity to take the helm at the women-centric brewery. "I hope to have found a forever home," she says. "Mujeres is the only place in town that you will consistently see more women than men patronizing our venue. We try to create a safe environment for everyone who comes. We host events that celebrate underrepresented communities, and therefore, we have an amazing group of customers that come from all backgrounds."

Favela says the response has proved that there was a need for this type of place. Women come to Mujeres "because we created a space for them," she says. Considering the relative scarcity of women—and Hispanic women in particular—both in the industry and among craft-beer drinkers, nurturing comfortable and accessible spaces with them as the primary focus remains rare. Yet the benefits are obvious.

With her beers, Olson says she hopes to provide for those who might not already be beer enthusiasts. "There are a lot of people who say we are their first craft-beer experience because they were too intimidated to go to another establishment," she says. "We are able to reach people who have previously been excluded from the craft-beer community." If Mujeres is able to break down barriers of entry for new consumers, she says, the entire San Diego beer scene stands to benefit.

Indeed, that's a lesson that could be applied anywhere.

## MEXICAN FLAVOR

While quality is a top priority, Favela says that a diverse tap list is equally paramount to appealing to a broad base of drinkers and keeping them coming back.

"People come in here and want to try stuff," Favela says, noting that many patrons opt for flights to sample as many beers as possible, such as their hazy IPAs, amber ales, or pilsners. "Our lightest beer that's always on tap—our Blonde Ale—that right now is kind of like our signature beer. It's a great intro beer." However, it's the Mujeres Michelada—a popular Mexican beer cocktail served over ice, mixing beer with tomato juice, lime, and a spicy, salty, chile-dusted rim—that's remained a top seller since day one.

"Our beers are always going to have some tie with our culture, whether it's the name, the fruit, or the adjuncts," she says. That includes the Café de Olla stout, for example, based on a Mexican coffee drink traditionally brewed in a clay pot with piloncillo sugar, cinnamon, and other spices. "For us, that's part of our culture."

Mujeres brewed about 160 barrels in 2021, Olson says, and she expects that to grow to about 240 barrels in 2022. Among other things, she plans to add a hard agua fresca and a gluten-free option.

Distribution is unlikely for now, Favela says. That's partly due to their limited size, but also because they want to welcome customers for the full Mujeres experience as it was meant to be: on-site. (However, she says, "Never say never.") Meanwhile, there are 32 oz crowlers for takeaway and a kitchen—also run by women, incidentally—providing Mexican food for those staying to enjoy the outdoor space.

## EVENTS AND EDUCATION ARE INTEGRAL

Mujeres' goal has always been to educate, empower, and employ women in all aspects of production. However, the pandemic has complicated the education aspect—especially at Border X's second location in Bell, California, where they had hoped to replicate a Mujeres-like club for the Los Angeles area. "November 2021 was our goal, but now it's looking more like spring 2022," Favela says.

Olson also hopes to share her brewing expertise once Mujeres Brew Club can safely and consistently meet again. "It's the one component that has been missing since I started," she says. On the plus side, the ongoing buy-in from Mujeres members and the surrounding community has been a major boost for the burgeoning brewery, pushing it from concept to local icon in a short time.

Beyond serving beer, events such as trivia, *lotería* nights (think traditional Mexican bingo), live music, craft fairs, and even healing sessions—many of which are Latina-led—have helped connect Mujeres more closely to the Barrio Logan neighborhood. "We stay in business because of our craft and our beer," Favela says. "We're

**"THERE ARE A LOT OF PEOPLE WHO SAY WE ARE THEIR FIRST CRAFT-BEER EXPERIENCE BECAUSE THEY WERE TOO INTIMIDATED TO GO TO ANOTHER ESTABLISHMENT," OLSON SAYS. "WE ARE ABLE TO REACH PEOPLE WHO HAVE PREVIOUSLY BEEN EXCLUDED FROM THE CRAFT-BEER COMMUNITY."**

**FROM TOP:** The Mujeres Brew Club gathered in the taproom; the taproom is designed to feel welcoming; Mujeres will brew about 240 barrels in 2022 on their small Premier brewhouse.

just taking it a step further. We're inviting the musicians, we're inviting artists, we're inviting small entrepreneurs and allowing them to use this space.

"That's not part of our 'business,'" she says. "This model, in other words, is not another business. That is just something that we've added, in addition to our brewery experience."

It hasn't been without challenges, but looking back on their collective accomplishments is mind-boggling for her. "The whole year has really just been a huge learning for us and the team," she says. "But it's also been amazing—it has been absolutely amazing to see the amount of support and the amount of women empowerment by other women, by other community leaders."

They've gotten this far without any similar models to follow, figuring it out on their own as they go. "I have to say that I am pretty proud that we've made it one year. Because you just don't know, right? I mean, no one could have showed up six months into this. … It's not like we had a road map. It's not like we had professionals teaching us and guiding us. It's all passion."

## MUJERES LOOKS AHEAD

"We made it through one year," Favela says, taking a moment to envision the future. "That doesn't mean we'll make it through another year. So what that means is [more] education, innovation, and learning."

It also means continuing to grow. "We're creating new positions for the current team," she says. "We now have an event planner, we now have Samantha leading the brewhouse, [and] Esthela will continue to innovate the club to further the education part—not only for our team members, but for new people who want to learn more about craft beer."

Favela's overarching hope is that the Mujeres method of community partnership and collaboration doesn't remain limited to San Diego. It can work elsewhere. Her advice to other breweries: "Don't be afraid to work with other people. It helps everyone. It helps us when the artists invite their friends for an art show. It's a mutual gain and relationship for the both of us."

Even with those ideals set early on, she says that taking that sudden leap from monthly club to full-blown co-op brewery was scary—yet ultimately worth every moment. "I'm proud of myself for taking that chance," she says. "Not just myself, but the club and the team and the girls—it's not just me. It's a group effort."

PHOTOS FROM TOP: VITO DI STEFANO; BETH DEMMONI (2)

# // PARTING SHOT

**The Craft Beer & Brewing Podcast** visited Belgium this past February, and here are some behind-the-scenes shots from the trip. Clockwise from top left: the whole cone hops that go into De Ranke XX Bitter; Antidoot's sheep; Raf Souvereyns of Bokkereyder pours gueuze; Pierre Tilquin poses with the coolship; 3 Fonteinen's heritage barley stalks; Urbain Coutteau of de Struise shows off their mash tun; Xavier Bailleux of Au Baron talks bière de garde; Tom Jacobs of Antidoot; Paula and Val of Atrium discuss fusion brewing; and Jean Van Roy of Cantillon talks lambic and fruit. Listen in to the conversations at **beerandbrewing.com/podcasts.**

PHOTOS: JOE STANGE AND JAMIE BOGNER



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