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The Journal of the American Homebrewers Association®

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Published by the American Homebrewers Association, a division of the Brewers Association. The purpose of the Brewers Association is to promote and protect small and independent American brewers, their craft beers, and the community of brewing enthusiasts. The Brewers Association is a not-for-profit trade Association under Section 501(c)(6) of the Internal Revenue Code. Offices are located at 1327 Spruce Street, Boulder, CO 80302 USA. Membership is open to everyone. *Zymurgy* (ISSN 0196-5921, USPS 018-212) is the bi-monthly journal of the American Homebrewers Association and is published six times per year. Periodicals Postage Paid at Boulder, CO and additional mailing offices. Canada Post Agreement Number 41197537. Annual memberships are \$43 U.S., and \$52 International and include a \$35 subscription to *Zymurgy*.

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By Dave Carpenter

All Brewers Great and Small



Crowds of beer lovers celebrate 36 years of the Great American Beer Festival.



Homebrew enthusiasts gather at London's Oval Space for the inaugural Brew Con.

The 36th annual Great American Beer Festival® (GABF) took place October 5–7 at the Colorado Convention Center in Denver. With 60,000 attendees, 800 breweries, and more than 3,900 beers available to sample, GABF 2017 was steeped in superlatives.

The American Homebrewers Association (AHA) booth was, as always, a focal point for GABF foot traffic. (The 20-foot tall pint glass makes us kind of hard to miss.) It was my pleasure to meet a number of AHA members, many of whom swung by at the Saturday afternoon members-only session to re-up for another year, to ask questions about member benefits, or to simply say hi and chat about yeast.

The AHA members-only session remains a popular fixture at GABF and illustrates the tight bond between amateur and commercial brewers. That relationship is only further affirmed at the awards ceremony—it's always a treat to look on as someone I have known as a homebrewer walks across the stage to receive his or her first GABF medal as a pro.

Congratulations to AHA members Doug Thiel, Daniel Tomkins, and Mark Boelman, whose professionally brewed homebrew recipes took gold, silver, and bronze in the GABF Pro-Am competition. Look for coverage of their wins—and their winning recipes—in the March/April 2018 issue of *Zymurgy*.

A little more than a month after GABF, I spoke at Brew Con London, the UK's first central gathering of homebrewers in I don't know how many years. Held in the industrial chic Oval Space overlooking the aging-but-iconic Bethnal Green gasworks, Brew Con featured homebrew talks, BJCP education, vendor demonstrations, and, of course, plenty of great beer.

As I wandered the expo floor, I wondered what this movement might look like in five, ten, or twenty years' time. The energy was palpable as the old scene of brewers laughing over pints played itself out once again. The homebrew bug had bitten, and there was every reason to believe that this was just the start of something big.

Then I recalled that the Great British Beer Festival had inspired AHA cofounder Charlie Papazian to establish the Great American Beer Festival in 1982. More than three decades later, things had come full circle. Somewhere, Michael Jackson had to be smiling.

Congratulations to Simon Gladding, whose Scottish export ale was named best of show at Brew Con's World Series out of 254 entries. Muntons, a *Zymurgy* sponsor, will fly Simon out to Portland this June for the AHA's Homebrew Con, where we look forward to welcoming homebrewers from around the world on June 28.

Dave Carpenter is editor-in-chief of *Zymurgy*.



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COLUMNS

1 | EDITOR'S DESK

All Brewers Great and Small

By Dave Carpenter

9 | FROM THE GLASS

Homebrewer Survey

By Gary Glass

92 | WORLD OF WORTS

Why Do They Brew?

By Charlie Papazian

96 | LAST DROP

Pink Boots Society

Enables a Second Career

By Janine Weber

FEATURES

26 | Homebrew Gadgets 2018

Sharpen your saws and dust off your drills. Zymurgy readers share the homemade homebrew tools that make for better brewing, cleaning, and serving.

By Zymurgy readers

40 | Brewing Automation

AHA member Martin Bradley's high-tech brewery is a labor-saving labor of love. Here, he shows us how he takes brewing automation to the next level.

By Martin Bradley

48 | Rise of the Machines

Brewing beer used to be all about buckets and carboys. Now countertop appliances make homebrewing as easy as pushing a button. We consider four of them here.

By Efraín Villa

57 | Cooking with Gas

Propane gas remains the fuel of choice for most homebrewers who conduct full wort boils. Learn how to connect several burners to a single propane source.

By Mark Pasquinelli

66 | The Many Ways to Weissbier

Typically brewed with simple ingredients and ale yeast, weissbier is a great style that can teach brewers a lot about brewing. Much complexity lies beneath the surface.

By Chris Colby



Southern Hemisphere Homebrewing

Experience the 2^a Copa Sudamericana de Homebrewers through the eyes and ears of Denny Conn's translator.

By Garrett Garfield

To read this special, members-only online feature, go to HomebrewersAssociation.org/jf18

QUICK RECIPE GUIDE

Terre au Verre.....	6	Kevin's Mom	70
Barley Phillip Irish Red	24	American IPA con Pomelo Rosado (Pink Grapefruit American IPA)....	74
SLF Pale Ale	44	Psychedelic Weisse (Berliner Weisse with Dragon Fruit and Guava)....	76
Tropical Haze	62	Weekday Bock (All-Grain)	93
Left on Golden Hefeweizen	68	Weekday Bock (Malt Extract).....	94
Holier than Meow Hefeweizen.....	69		



Find these homebrewing recipes and more on our website @ HomebrewersAssociation.org/homebrew-recipes



>> GET THERE!

18TH ANNUAL ARIZONA STRONG BEER FESTIVAL

Phoenix and the Sun enjoy a close relationship. After all, the latter shines down upon the former about 4,000 hours every year, an average of 11 hours per day. Even the city's NBA team takes its name from Earth's closest star. And once a year, beer enthusiasts observe a day when Phoenix and Sol share something even stronger: high gravity.

Perhaps we stretched more than we should have for that bit of extraterrestrial wordplay, but you won't have to reach far to find a tasty beverage at the Arizona Strong Beer Festival, which returns for the 18th time on February 10, 2018. Hosted by the Arizona Craft Brewers Guild, this one-afternoon event features more than 400 beers from over 100 breweries and is a highlight of Arizona Beer Week.

General Admission costs \$60 and includes 40 tasting tickets, each of which is legal tender at the fest for a 2-ounce (59 mL) pour. An \$80 VIP ticket gets you in 90 minutes early and entitles you to exclusive restrooms, a food voucher, and your very own commemorative trucker hat. If you want to go whole hog, spring for the \$100 Super VIP, which also includes admission to the Brewers Reception Friday night and no-wait entry to the festival on Saturday.

At press time, participating breweries included Bell's, DESTIHL, Dragoon, Great Divide, Prairie Artisan Ales, Smuttynose, Uinta, Wren House, and about 130 others.

For more information, go to arizonabeerweek.com.

January 4–6

Big Beers, Belgians, and Barleywines Festival

Breckenridge, CO

bigbeersfestival.com

January 13–21

Kalamazoo Beer Week

Kalamazoo, MI

kalamazoobeerweek.com

January 19–20

Yaga's 9th Annual Chili Quest & Beer Fest

Galveston, TX

yagaschiliquest.com

January 20

8th Annual Jolly Skull Beer and Wine Festival

Greenville, NC

beerarmy.org/jollyskull

January 27

7th Annual NC Rare & Vintage Beer Tasting

Durham, NC

ncrarebeer.com

January 27

8th Annual Belgian Fest

Seattle, WA

washingtonbeer.com

February 2–3

Festibière d'Hiver

Gatineau, QC, Canada

festibiere.ca

February 9–18

10th Annual SF Beer Week

San Francisco, CA

sfbeerweek.org

February 16–19

Max's Taphouse Belgian Beer Fest

Baltimore, MD

maxs.com

February 23–24

13th Annual Winter Beer Festival

Grand Rapids, MI

michiganbrewersguild.org

February 23–24

Clarens Craft Beer Festival

Clarens, South Africa

clarensCraftBeerFest.com

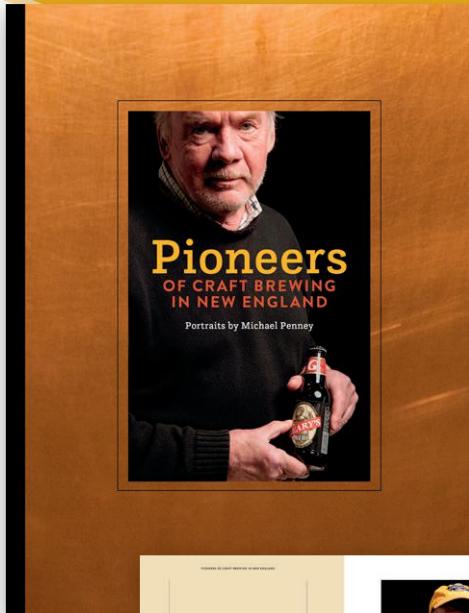
February 24

Downtown Missoula Winter Brewfest

Missoula, MT

missouladowntown.com

For more craft brewing events, go to CraftBeer.com



>> BEER BOOK: *PIONEERS OF CRAFT BREWING IN NEW ENGLAND*

BY MICHAEL PENNEY

Pioneers of Craft Brewing in New England isn't your typical beer book. You won't find lengthy brewer bios and loquacious taproom origin stories on these pages. You won't leaf through floral descriptions of hops and malt. You will, however, gain an intimate glimpse of the people behind the beer.

New Hampshire resident Michael Penney has documented American craft beer in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont the only way a professional photographer could. Through vivid but honest portraiture, he captures the tenacity and passion that propel American craft forward.

When someone asks why it's important to support small and independent breweries, you could launch into a soliloquy. Or you could simply hand them this book—the independent spirit of American beer is etched on the faces of those who make it happen.

For more information, and to purchase your own copy, visit behindthebeer.net.

Photos courtesy of Pioneers of Craft Brewing in New England; LolliHops®



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If you're a sucker for suckers, hop on over to yakimahopcandy.com.

“I've only
been in love with a
beer bottle and
a mirror.”

—Sid Vicious

>> CLUB NEWS:

STAN HIERONYMUS JOINS LONG ISLAND HOMEBREWERS FOR LOCALLY GROWN BEER

By Andrew Luberto

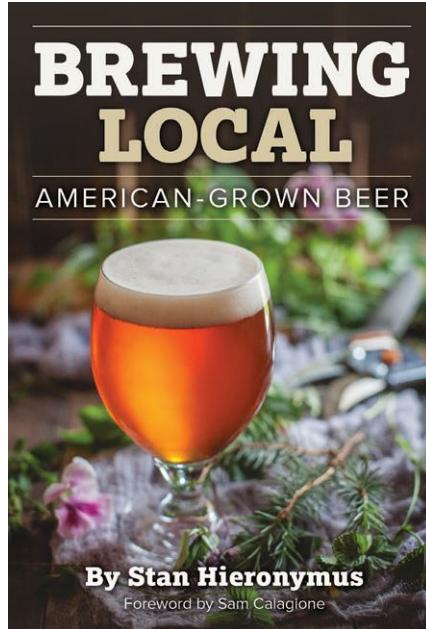
This past August, author and renowned craft beer authority Stan Hieronymus visited the New York City/Long Island area for a series of events to promote his newest book *Brewing Local*. In the spirit of his book, Brooklyn homebrew shop Bitter and Esters organized a foraging expedition in Central Park, led by a trained botanist and forager, to gather ingredients for a series of homebrews presented during Stan's visit.

If you run a homebrew club, I highly recommend organizing a social foraging event like this with a trained professional. The foraging and then later group tastings are great social activities.

Leading up to his visit, Moustache Brewing Company in Riverhead, N.Y. collaborated with Stan and me to create a beer using only local ingredients. The beer was named *Terre au Verre* (French for "ground to glass") and was developed to go with a three-course, beer-paired brunch organized by the Long Island Beer and Malt Enthusiasts (LIBME) at The Fifth Season restaurant in Port Jefferson, N.Y.

We settled on a saison early on, with the initial intent of using local wild cultivated yeast for the beer. Labs like Bootleg Biology are making this easy for local homebrewers to do. Ultimately this ended up being impractical at a commercial scale, but our homebrew club plans to experiment with various wild yeasts as an interesting perspective into the ever-expanding field of American wild ales.

Stan suggested using lavender stems—the woody part of the bush, not the flowers—an idea developed by Scratch Brewing in Illinois. A friendly phone call to Scratch revealed that boiling lavender stems for 60 minutes gives a woody, cinnamon-like character. This ended up complementing the beer's spicy phenols,



Find Stan's latest book,
Brewing Local, at
BrewersPublications.com

with none of the flavors and aromas you would typically associate with lavender flowers. Local lemon verbena leaves heightened the citrusy brightness commonly found in saisons.

One of the best things about brewing this beer was the opportunity to visit and talk with some of the local farms on the East End of Long Island. Helping develop *Terre au Verre* reminded me that there's comfort in being rooted to a community, where one can simultaneously make sense of one's surroundings and find a place to fit in.

A point Stan stresses in *Brewing Local* is how integral local ingredients and flavors are to craft beer and homebrewing. These express local customs and culture in a trend that will likely grow as consumers continue opting for fresh, familiar craft beer creations from neighborhood breweries, and as friends keep sharing their homebrews.

TERRE AU VERRE

Recipe courtesy Andrew Luberto and Stan Hieronymus

Batch Size: 5 US gallons (18.9 L)

Brewhouse

Efficiency: 72%

Original Gravity: 1.048 (11.9° P)

Final Gravity: 1.008 (2.1° P)

Bitterness: 14 IBU

Alcohol: 5.2% by volume

FERMENTABLES

7.2 lb. (3.27 kg) pale malt

10 oz. (283 g) Carafoam malt

1 lb. (454 g) wildflower honey (flameout)

HOPS

0.3 oz. (9 g) Chinook or a similar bittering hop @ 60 min

YEAST

White Labs WLP568 Belgian Style Saison Ale Yeast Blend

ADDITIONAL INGREDIENTS

3 lavender stems @ 60 min

0.5 oz. (14 g) lemon verbena @ 0 min

BREWING NOTES

Mash at 150° F (66° C) for 60 minutes, lauter, sparge, and collect wort. Add hops and lavender stems and boil for 60 minutes. Add honey and lemon verbena at flameout. Pitch yeast at 70° F (21° C) and let beer slowly warm to 80° F (27° C) for three days. Carbonate to 3 volumes (6 g/L) of CO₂.

EXTRACT VERSION

Replace malts with 5.5 lb. (2.5 kg) extra light malt extract syrup or 4.5 lb. (2 kg) extra light dried malt extract and proceed with the boil as above.

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By Gary Glass



Homebrewer Survey

In 2017, the AHA conducted an extensive survey of home beer- and wine-makers as a follow-up to a similar survey conducted in 2013. This collection of data helps your association be the leading source of information on homebrewing and promote our hobby to the media. The information we gather helps us gauge the health of the hobby and help homebrew supply shop owners better understand the homebrew market. Here are some highlights from the 2017 survey:

- There are approximately 1.1 million homebrewers in the USA.
- Homebrewers in the USA make a combined 1.4 million barrels of beer per year (43.4 million gallons or 164 million liters). If combined, the output of homebrewers in the USA would make us the third largest craft brewer in the country, right between Samuel Adams and Sierra Nevada.
- A large portion of today's homebrewers are relatively new to the hobby, with 40 percent having started within the past four years.
- Homebrewers are making an average of 8.3 batches of beer per year (9.4 for AHA-affiliated brewers) and are averaging 6.0 gallons (22.7 liters) per batch (6.7 gallons/25.4 liters for AHA-affiliated brewers).
- Nearly all homebrewers (94 percent) shop at local homebrew stores, with an average of 7.8 visits per year, though a large majority (76 percent) also shop online and average 5.6 online purchases per year.
- Overall, homebrewers report spending an average of \$738 per year on ingredients and equipment (\$917 per year for AHA-affiliated brewers).
- The top reason cited for homebrewing is the creative, artistic aspect of the hobby.
- The average age of homebrewers is 42,



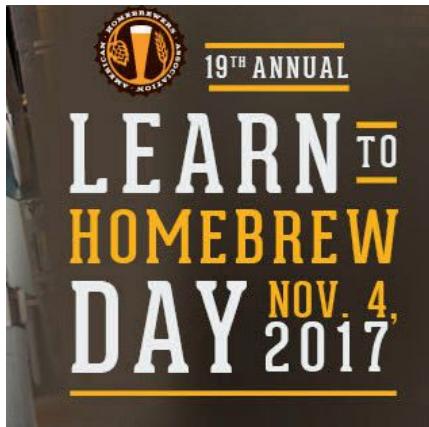
but the fastest-growing age group consists of those 60 and older.

- With 31 percent of US homebrewers, the South has the largest portion of homebrewers in the country. The Midwest is second with 25 percent, followed by the Northeast at 24 percent, and the West at 19 percent.
- Survey respondents were overwhelmingly male (93%) and white (89%). (Note: the AHA Governing Committee's Diversity and International Subcommittee recently split into separate subcommittees to allow for greater focus on increasing diversity among homebrewers in the USA.)

Capitol Hill Staff Homebrew Competition

On December 4, Michael Rodger of the US Capitol Police was crowned champion brewer in the AHA's second annual Hill Staff Homebrew Competition with a chocolate-, pepper-, and spice-infused sweet stout. This competition, open to legislative staff and other federal employees on Capitol Hill in Washington, D.C., is a fun, non-partisan outlet that increases awareness of and appreciation for homebrewing in this influential group.

The judging took place on December 3, at Atlas Brewing Company in Washington,



The Brew Shop, Arlington, VA

Motor City Mashers, Southeast Michigan



Hangar 41 Brew Club, Fort Myers, FL



Worthogs Homebrew Club of New Mexico



York Area Homebrewers Association, York, PA

D.C., and the winners were announced the following day in the Rayburn House Office Building, which houses the offices of 169 US Representatives.

My thanks go to Brewers Association federal affairs manager Katie Marisic and AHA competition coordinator John Moorhead, along with our judge and steward volunteers for making this competition a reality.

Learn to Homebrew Day

Thank you to all of the homebrewers out there who participated in our 19th annual Learn to Homebrew Day, celebrated on November 4 (always held the first Saturday in November). Hundreds of homebrewers worldwide shared their knowledge and passion by introducing friends and family to the greatest hobby ever. At 295 registered sites, 4,783 homebrewers learned how to make beer at home.

Rade gast Club of the Year Entries

Are you a member of a homebrew club that could use some worldwide recognition for all of the amazing homebrew-y things you do? Let us know about it by submitting an entry for the Radegast Club of the Year award (aka the Awesome Club of Awesomeness award). This award puts a spotlight on the awesome things that homebrew clubs do to promote homebrewing and support their local communities.

The winning club takes home a super cool mash paddle trophy from award spon-

sor Yakima Chief-Hopunion and splits a \$1,000 cash award with a charity of the club's choice.

Entries are due by March 31. The winning club will be announced during the awards ceremony at Homebrew Con 2018 in Portland, Ore. See the Community section of HomebrewersAssociation.org for more details.

Homebrew Law in North Carolina

In November, Matt Smith, the director of the North Carolina Homebrewers Alliance (NCHA) informed me that the North Carolina Alcoholic Beverage Control Commission (ABC) had proposed some rather onerous rules to inform their enforcement of recently passed homebrew legislation that allowed for serving homebrew at events. I personally wrote to the ABC, as did around 30 North Carolina homebrewers who heeded a call from the NCHA on short notice. As a result, the ABC decided to withdraw the originally proposed rules so they could re-draft them and take into account the response the commission got from the homebrewing community.

The originally proposed rules would have negatively affected the North Carolina homebrewing community by restricting judges' ability to enter competitions, limiting the combined volume of entries in competitions to 80 liters (roughly 112 entries), and limiting the types of events that could charge a registration fee for competitions (so no Homebrew Con-type events). However, I believe that the restrictive nature of the proposal was more about misun-



derstanding homebrewer events than a malicious attempt to restrict homebrewer activity. It was gratifying to see a reasonable response by government officials to the objections respectfully submitted by homebrewers. The result will be a greater understanding of the local homebrewing community by ABC.

The NCHA is also supporting Senate Bill 604, which seeks to expand the types of events where homebrew can be served. The bill has passed the state Senate and will be taken up by the House when the legislature reconvenes in January.

Last Chance for Give-the-Gift

The AHA's annual end-of-year AHA Gift Card membership promotion comes to a close December 31. If you are reading this before the end of the year, you still have time to buy an AHA Gift Card good for a year of membership that includes your choice of a free copy of *For the Love of Hops* or *Brewing Local* by Stan Hieronymus or a double-walled stainless steel AHA tumbler/koozie (I've got one and I love it!). What a deal! You get yourself or a friend a year of membership, score some cool swag, and get that warm feeling from supporting a totally worthy cause.

Until next time, happy homebrewing!

Gary Glass is director of the American Homebrewers Association.

2018 Calendar

With 2017 coming to a close, it's time to look forward to some of the great events and milestones the AHA has planned for 2018:

January 23–January 30

AHA National Homebrew Competition entrant application window

Mid-February–March 31

AHA Governing Committee election ballots accepted

Early March

AHA Homebrew Con Portland registration opens

April 6–April 22

AHA National Homebrew Competition first round judging

March 31

Deadline for entry submission for the **AHA Radegast Club of the Year Award** (*see community section of HomebrewersAssociation.org for details*)

May 5

Big Brew/National Homebrew Day

June 28

AHA National Homebrew Competition final round judging at Homebrew Con in Portland

June 28–30

AHA Homebrew Con Portland

August 4

Mead Day

September 20–22

Great American Beer Festival®

November 3

Learn to Homebrew Day

December 7

AHA's 40th birthday



Visit the Calendar on HomebrewersAssociation.org for the most up-to-date listing of events, including upcoming AHA Rallies and AHA/BJCP sanctioned homebrew competitions.

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By Our Readers

When Your Dunkelweizendoppelbock Isn't Dunkel Enough

Dear *Zymurgy*,

When I read Horst Dornbusch's article about the obscure Dunkelweizendoppelbock style (Jan/Feb 2016), I became intrigued and put it on my bucket list of beers to brew. I loaded the all-grain recipe into my brewing software, but the calculated SRM is only about 18 and the IBUs only about 20. The printed recipe pegged them at 40 and 35, respectively.

I'm planning a 10-gallon batch, so I simply doubled the grain and late hop addition quantities. I adjusted the IBUs by increasing the bittering addition to reach the target 35 IBU value. But, I'm at a loss as to which of the dark malts to increase because I want the flavor profile to be very similar to that described in the article.

Help me, please!

Kevin Henderson
Washougal, Wash.

Horst Dornbusch responds: You are correct that I grabbed the wrong number for color from my spreadsheets. The color value of the Dunkelweizendoppelbock should be close 15 to 20 SRM or a tad under 40 EBC, at constant OG, depending on your system's extract efficiencies. I apologize for this error. However, we generally consider a wort "dunkel" if its color value is above 15 SRM, so the harm is more theoretical than practical.

Many things can affect wort color. First, there is the mill gap. Grain milled at a tight 0.8 mm produces a very different result for many wort parameters, including lauter speed, extract volume, and extract color than does the same grain bill crushed at, say, a wide 2.2 mm mill gap.



Second, there is friability, which measures how well a grain can be broken into smaller pieces. A base malt should be at least 75 percent friable; 85 percent is considered good, and 95 percent is considered excellent.

Then there is the plumpness value of the malt, also referred to as selection. In a good batch of malt, at least 90 percent of the kernels should have a diameter greater than or equal to 2.5

mm. This is not always the case, especially in bad harvest years. For the current 2016/17 crop year, for instance, which was disastrous in several important barley-growing regions, some maltsters might have had to accept a selection of as low as 80 percent plumpness, which means 20 percent of the kernels have a diameter of less than 2.5 mm. This changes the ratio between husk material and starch and thus affects extract values.

A malt's protein value also makes a difference. Maltsters and brewers get the best results with malts that have a protein value of 10 to 11 percent of the malt's weight. Excessively high protein values cause lautering problems, while excessively low protein values cause beers that have no body. Either extreme can affect wort color.

One often overlooked element is the relationship between the total grain volume and the nominal extract efficiency of the brew house, which in turn is influenced by the type of false bottom (V-wire vs. laser-cut, for instance), the depth of the grain bed, and the aspect ratio of the mash tun. I have brewed on systems with a mere 50 percent calculated efficiency and on systems with almost 80 percent efficiency. Depending on the system efficiency, at specified OGs, different wort volumes of different colors can result from otherwise identical grain beds. This is one reason why color specs in recipes tend to have very little predictive power.

Of course, different programs make very different assumptions about all of these factors. Using the U.S. imperial system for wort color, I multiply the Lovibond ($^{\circ}\text{L}$) value of each grain in the mash by its weight in pounds and divide each result by the volume of wort in gallons extracted from the mash. I then add up all the values thus obtained. This sum is often called the Malt Color Unit (MCU). I plug the MCU into the following formula to obtain the SRM color for the wort:

$$\text{SRM} = 1.4922 \times \text{MCU}^{0.6859}$$

The corresponding EBC color value is approximately 1.97 times the SRM color.

Because maltsters specify the colors of their malts as ranges, I performed several calculations for the Dunkelweizendoppelbock. I did calculations for minimum, maximum, and average color values of the individual grains, in both the metric and the imperial system.

As for IBUs, there is much debate in the literature about the contribution of different hop additions at different times relative to wort gravity, boil length, and alpha acid concentrations in the different hops. Here is how I do it. I first calculate the theoretical IBU contribution of the first hop addition using



▲
Pitcher in the Rye best-of-show winner, Ryan Walker, flanked by Paul Schroeder of BSG (left) and Crystal Lake brewmaster Ryan Clooney (right).



▲
Pitcher in the Rye medal winners, from left to right: Andy Denton (of Perfect Brewing Supply), Larry Erbach (category gold medalist), Brian Bellman (category gold medalist), Chris Kaszuba (category silver medalist), Jerry Machula (category bronze medalist) and Nancy Fanta (of What's Brewing?).

$$\text{Bittering addition (in ounces)} = \\ (V \times \text{IBU}) \div (7462 \times U \times AA)$$

In this calculation, I pretend that this is the only hop addition to my beer. Thereby, V is the wort volume in gallons; IBU is my target bitterness; U is a hop utilization coefficient, which usually ranges from 0.06 to 0.3, depending on boil length; AA is the nominal alpha acid content of the hops as specified by the producer; and 7462 is a constant that applies to the imperial system.

For the flavor and aroma additions I am more interested in aromatics than iso-alpha acids. Therefore, I specify the amounts of

these additions up-front by weight. Using the same formula as above, I then calculate how many IBU these additions contribute to the wort. I add up these values and subtract them from my target IBU for the wort. I use this new number to re-calculate the actual (as opposed to pretended) weight of the bittering hop addition.

I know of other formulae that take a different approach for estimating the bitterness contribution of the different hop additions at different times in the kettle and later. However, the above approach is entirely logical. I double-checked all my figures and get a total IBU value of approximately 35 IBU for the brew with the hops I used.



I have used this approach in hundreds of recipes; and several of my beers (though not this Dunkelweizenbock, which was brewed in Montreal) have been assayed for IBUs and other specs in sophisticated labs in Europe, one at a large hop processor and the other at a large maltster. These labs have always confirmed my bitterness values, as long as the hops were fresh, of course.

I hope this helps!

Pitcher in the Rye

Dear Zymurgy,

Crystal Lake Brewing just completed our first ever Pitcher in the Rye homebrew competition. It raised money for a local charity, 1Pet1Vet, which trains and provides service dogs for veterans with PTSD, and was sponsored by Hopsteiner, BSG Craft Brewing, Spike Brewing, Crystal Lake Brewing, and local homebrew supply shops Brew and Grow, Perfect Brewing Supply, and What's Brewing? Homebrew Supply. Thanks to all of our sponsors and all who participated!

John O'Fallon
Co-Founder, Crystal Lake Brewing
Crystal Lake, Ill.

With This Beer, I Thee Wed

Dear Zymurgy,

When our son Evan and his fiancée Sara decided to get married, Evan wanted to make some homebrew for their reception.

Perfect! We have been homebrewing since 1988, when we made a wheat beer to celebrate his birth.

Evan decided to brew the 2016 NHC gold-medal-winning pale ale and a Boulevard Unfiltered Wheat clone, and I picked one of my favorites, a Dogfish 90 Minute clone recipe. I wasn't sure how well the homebrew would go over, as it was competing with commercial beer the venue was offering. I didn't think it all would get finished.

Boy, was I wrong! Fifteen gallons of beer disappeared in one hour. It surprised us all. The guests' comments were amazing: "I need to learn how to homebrew." Kevin, a groomsman, was a big salesman as they walked into the reception and saw the kegerator. "This guy made this beer in his driveway. Try it. It's excellent!"

When we talked to Evan a couple of weeks later, we asked him how he thought everything went. "Fine," he said. "Everything went so fast. We just needed more homebrew!" The theme of the reception was "Relax, don't worry, have a homebrew," and many did just that.

Thanks so much to the AHA. We could not have had the success we had without you.

Ben and Yvonne Rapp
Lawrence, Kans.

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Sweet, Sweet Mead

Dear Zymurgy,

It was with a bittersweet smile that I read the Sept/Oct 2017 issue and checked out the winners of the National Homebrew Competition. Perhaps I could have been one of the listed lucky winners, having earned a gold medal in the first round for my sweet mead. I have to admit that my chances were slim, as I only scored in the low 30s and therefore had little hope of coming in first in Minneapolis, but to at least have been judged at the national level would have been nice.

Unfortunately, after receiving notice of my first-round placement and being asked to submit two more samples for judging in the final round, I discovered that a slightly enthusiastic party with friends had resulted in every last bottle being consumed. I had nothing to send in!

So, if I can be so bold as to provide advice to others dreaming of blue ribbons and photos with Charlie, it will be to hide your bottles from thirsty friends, and remember that you need four samples, not two.

Angus Low
Greenfield, Wis.

Editor-in-chief Dave Carpenter responds:
This is totally something I would do. Thanks for the advice!

Send your Dear Zymurgy letters to zymurgy@brewersassociation.org. Letters may be edited for length and/or clarity.

Hey homebrewers! Submit your homebrew label for Dear Zymurgy section, at homebrewersassociation.org/magazine/submit-bottle-label.



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By Professor Surfeit



Foul! The Play is Under Further Review

Dear Professor,

I am composing this as a question, but honestly, I think it's more of a gripe. In the 2017 September/October Zymurgy feature that highlights the National Homebrew Competition winners and their gold-medal-winning recipes, I took notice of the winning English pale ale recipe, and after scratching my head, I called foul.

I'm sure Rocket Surgeon Summer Ale was very good. And I bet Scott and Dave Anderson's winning recipe really stood out among the other 246 entries in their category, especially if their fellow competitors brewed with earthy, floral English hops as opposed to Cascade and Falconer's Flight 7Cs.

Here is the question/gripe: How does a beer that has most of the characteristics of an American pale ale outscore beers that (I hope) were brewed with true-to-style hops and yeasts? Shouldn't a beer with a hop character that is out of style get dinged for it?

I presented this question to some of the members of my homebrew club who are BJCP judges. They responded with horror stories of sitting at tables with judges who don't know the styles they're judging, who step outside to smoke a cigarette between flights, or who ding beers for having characteristics that should be present in a certain style but would be bad in others, e.g. corn flavor in a cream ale as opposed to a pale ale.

I have nothing against Scott and Dave. I'm sure they're great brewers. I am just feeling flummoxed about an apparently American-style pale ale winning gold in



the English pale ale category at this level of competition.

Thanks for listening (OK, reading, actually).

Tom Beach

Oh boy, Tom,

What a doozy of an observation and throwing the yellow flag. Question? Gripe? It doesn't matter. Your points are worthy of review over a few pints of English-style pale ale. From my vantage point, and also from my beer experiences, there two very distinct sides to this issue.

But first, let's address one concern you have. A BJCP judge (or for that matter, any beer judge worthy of the title) should never, ever be smoking between flights of judging.

Judging directors are responsible for dismissing people who are not acting in the best interests of judging beer.

On the other points you make, yes, it's probable that sometimes beer judges might not understand the elements of a beer style, but I would be surprised if a certified judge didn't understand the differences in hop character between English and American styles of pale ale.

Yes, I, too, would be suspicious of the evaluation process when a blend of Cascade and Falconer's Flight hops is used in an English-style and it comes out on top. That said, I have to say that I have sampled perfect-tasting English-style pale ales and bitters that were actually brewed with Cascade hops. While this statement might sound unbelievable, it's true.

I was dumbfounded when I enjoyed an English-style ale brewed by a respected craft brewery and complimented them on the use of hops of English origin. They returned my compliment by revealing that they used 100% Cascade hops! I asked, "How did you do that?" and their answer was a smile and "That's a secret."

So, one line of reasoning I believe is that you can eke out certain character profiles from hops using scientific brewing knowledge and skill. Could Cascade and Falconer's Flight hops be utilized in special ways (process, water, temperature, timing, etc.) to encourage English-style hop character? Yes, I think so. Now, that said, it is quite misleading to present a simple recipe without the detailed background of how and why Cascade and Falconer's Flight hops resulted in English character.

I looked at their recipe and noted the unusual addition of baking soda in the recipe. Could that have an effect on hop character? Yes it could, but to what degree and what the science is, I plead ignorance.

I, too, would have been suspicious at first. It's always the first reaction to blame the

judges, but you can't second guess what they actually experienced.

One more note. If you have been brewing for over a decade, you probably remember that Cascade hops were once quite lemony and citrus-like. Cascade hop character has changed dramatically, and it is certainly not the same hop it used to be.

I have Cascade hops growing in my yard from cuttings that I was given in the very early 1980s. The character of my Cascade hops is true to the original, but commercially available Cascade hops today are nothing like what they used to be. Modern Cascades lean a bit more toward what we would normally think of as an English profile, but they don't usually manifest themselves as definitively English in character.

I guess I've rambled on enough. You know, when you ask me about hops, beer styles, judging, and perception, you'll instigate my own ramble.

Meanwhile—foul. What is it? Encroachment? Offside? Unnecessary roughness? Taunting?

Celebration? The play is still under review... indefinitely.

Your humble observant,
The Professor, Hb.D.

Can Yeast Get Montezuma's Revenge?

Dear Professor,

As you've pointed out several times in your columns, fresh beer is the best beer. And the freshest beer is at the brewery (or, in the case of homebrew, at home). But, why is that? What happens when beer travels from point A to point B?



Yes, I do notice more of an "aged" flavor in well-traveled commercial beer, but I figure the agitation in any beer that travels simply encourages the mixing of gas in the headspace with the

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beer and stimulates oxidation reactions a bit more quickly. That makes sense. But I notice something different with my homebrews. Even when I bring a bottle of homebrew to a nearby friend's house to share and enjoy, sometimes it just doesn't taste as "perfect" as it does at home.

What's going on? I mean, my homebrew doesn't really get an increased oxidation character. What I taste is kind of undefinable but certainly different. Can you please explain what might be happening?

Alex McBride
Kilgore, Texas

Holy moly, Alex,
I hear you. I've noticed subtle changes in my own homebrew when it travels, but I've never clearly addressed this continuing quandary. You are probably right about agitation in commercial beer causing faster oxidation reactions. Mind you, such reactions don't happen instantly, but they do degrade beer over time.

I appreciate the way you asked your question: "Please explain what might be happening..." I can't tell you definitively what's going on with our homebrews but I'll give it a shot.

We know that one of the defining differences between homebrew and most commercial beer is that homebrew has yeast in it. When beer travels and gets agitated, that yeast is both a good thing and a maybe-not-so-good thing. The live yeast can scavenge oxygen that gets dissolved in the beer, and that in turn reduces the potential for oxidation and protects the beer.

On the other hand, quiet yeast sediment at the bottom of the bottle is asleep, so to speak, when resting in your home stash. But, when your homebrew begins to move, the yeast actually can sense the disturbance. That disturbance can trigger yeast to anticipate what it perceives as impending fermentation activity. That causes a reaction in the yeast cell to begin metabolic activity, using some of its glycogen reserves.

Whenever there is any kind of metabolic activity, there are consequences. Those con-

sequences manifest themselves as byproducts that can have flavors and aromas. And these consequences can be quite immediate; they don't take days or weeks. They can happen quickly at that microscopic level we call cell activity.

So that is what I think might be going on with our traveling homebrew. The traveler's "sickness" our homebrew experience is real, but the impact is usually quite low, rather nuanced, and not necessarily that detri-

tal to the overall quality of our beer. Who knows? Maybe it depends on the type of beer, yeast strain, and other factors.

Always thinking—thinking is fun,
The Professor, Hb.D.

**Have a question for The Professor?
Send it to professor@brewersassociation.org.**



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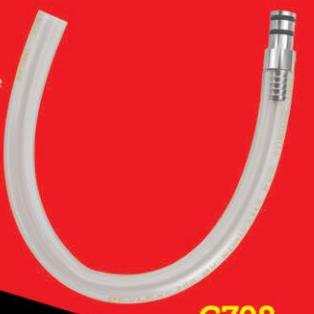
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By Amahl Turczyn

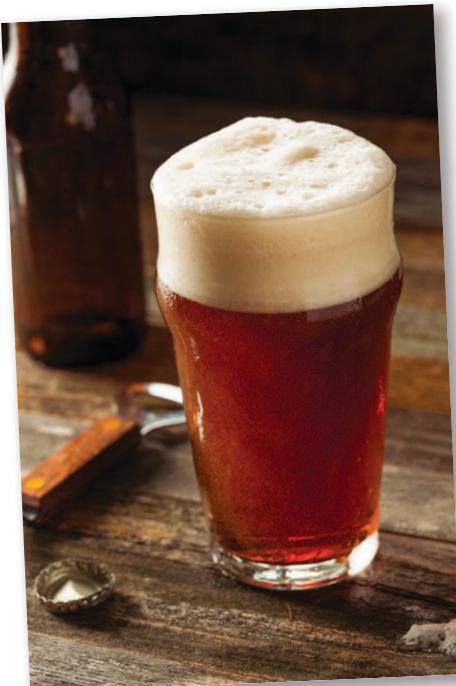
Irish Red Ale

While dry stout is arguably Ireland's most famous beer, Irish red ale goes back a long way, too. Some think the style was an interpretation of British bitter, as Irish stout was an interpretation of London porter, but from a recipe perspective, red ales have more in common with Scottish ales of similar gravity. British pale ale has more of an emphasis on hops and tends to rely on crystal malt to balance sweetness with hop bitterness.

Instead, as with Scottish ales, balance in Irish red ale is achieved with a judicious amount of roast barley. The main flavor component is a rich, well-kilned pale base malt, and the barest hint of roast barley provides a dry finish as well as a beautiful red color. Unlike Scottish ales, however, there isn't a tradition of long boils to encourage the kettle Maillard reactions that produce caramelized malt flavors.

Well-brewed Irish reds are malt-forward but not sweet, and deliver hints of toffee, toast, and nuts with a neutral to slightly sweet, grainy palate that dries to a clean, smooth finish. Some brewers add a bit of caramel malt, but the perception of caramel in the beer really should come more from base malt sweetness than from specialty malts. Hops are minimal to negligible. Some examples may have a faint buttery hint, but it should be more a product of toffee-like malt character than diacetyl. Like suggestions of smoke in a Scotch ale, any hint of butter should be a sensory nuance that works harmoniously with the other flavors in the beer.

The style has a brief history; it was first brewed in the town of Kilkenny in 1710. Since then, it has largely been eclipsed by dry stout, and while it's survived as a style, it has never really enjoyed the same popularity. Michael Jackson writes of certain



exceptional examples brewed in Ireland and North America, but sadly, these have been mostly lost or absorbed by large brewing conglomerates. In the last two decades though, Irish and American craft brewers have rescued Irish red ale and, with a little creative license, delivered some really tasty modern examples.

Of course, in typical fashion, some US craft brewers have taken American liberties with Irish red, brewing big, boozy, and often caramel-coated versions that deliver a ton of flavor, an unnecessarily generous punch of aroma and flavor hops, and an often exaggerated roasty finish. Many applaud this backlash against the dumbed down Big Beer versions, but others could rightfully argue that the delicacy of the style gets a bit trampled.

Various mass-produced versions carry the same brand names as once-great original brands; some of these are now

brewed with lager yeast and have been mass-marketed to Americans for decades as crushable St. Patrick's Day mainstays. Many of today's craft enthusiasts were introduced to the style by beers like Smithwick's and Kilkenny (now owned by Diageo) or Caffrey's and George Killian's (now owned by Coors). They tend to be smooth, light, and drinkable, some with nitro widgets in the can to simulate a Guinness-like pour and make them even smoother and more drinkable. While there is nothing wrong with these pub pounders, they look the part, but don't deliver nearly as much flavor as they once did.

Smithwick's (pronounced "Smithicks") used to be the gold standard for the Irish red style, and after being acquired by Guinness, it remains very popular; it's just not the beer it once was. The recipe included here (Barley Phillip Irish Red) is based on an old Smithwick's recipe, and, based on Jackson's notes, it calls for 10 percent flaked corn (in lieu of brewer's corn syrup) and about 3 percent roast barley. Some sources say Smithwick's is now made with dark caramel malt and a small percentage of sugar, which would account for the lighter flavor.

Folks interested in entering an Irish red into competition would do well to note that several amateur brewers in the UK and the US have won awards in the category by bolstering the base malt in their recipe with Vienna malt. Using 20 to 50 percent Vienna alongside Maris Otter pale malt amps up the malt character without resorting to caramel malt. Many also add a bit more roast barley—up to 6 percent of the total grain bill—and then temper that with a similar percentage of dark caramel malt. This has the effect of intensifying flavors and palate weight, but use caution with this approach; the beer will

be more attention grabbing with a bolder malt profile, but at the expense of drinkability. This is still meant to be a smooth, easy-drinking session beer, and too much roast or caramel can throw off the balance and lightness of the style.

Water for Irish red ale should be soft, with calcium in the mash and the sparge. One gram per gallon of calcium chloride added to reverse osmosis water should be sufficient. It will accentuate maltiness without bringing an edge to what little hop character is present in the beer.

Irish ale yeast is the natural choice for the style, as it's clean and fairly unobtrusive, and it will allow a cautious brewer to largely avoid ester production, especially when fermented in the low to mid 60s °F (16–18° C). An interesting alternative is the Nottingham strain. This is a seasonal release offered in September and October by White Labs as a Platinum series strain, and although it produces a bit more in the way of fruity character and fusel alcohols, it attenuates better than Irish ale yeast, allowing for a drier finish. Nottingham is also available from other suppliers as a dry yeast.

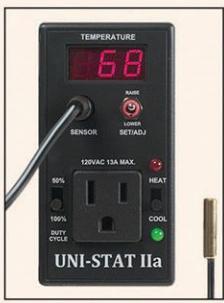
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BARLEY PHILLIP IRISH RED

Batch Volume: 5.5 U.S. gallons (20.8 L)

Original Gravity: 1.047 (11.8° P)

Final Gravity: 1.009 (2.3° P)

Bitterness: 20 IBU

Color: 13 SRM

Alcohol: 5% by volume

MALTS

8 lb. (3.63 kg) Maris Otter pale malt

1 lb. (0.45 kg) flaked maize

4 oz. (113 g) 500° L roast barley

HOPS

1.25 oz. (35 g) East Kent Goldings, 5% a.a.
@ 60 min (20 IBU)

YEAST

White Labs WLP039 Nottingham or Irish ale yeast (2L starter)

WATER

1 g/gal. calcium chloride added to reverse osmosis (RO) or distilled water

BREWING NOTES

Mash malts at 148° F (65° C) and allow to rest one hour. Apply heat or boiling water to increase temperature to 168° F (76° C) over 20 minutes. Hold at 168° F (76° C) for another 10 minutes to mash out. Sparge at 168° F (76° C). Boil 90 minutes. Chill to 60° F (16° C) and oxygenate. Pitch a strong starter of yeast. Ferment at 65° F (18° C) until final gravity is reached if using Irish ale yeast, or 60–61° F (16° C) if using Nottingham.

EXTRACT VERSION

Substitute 6 lb. (2.72 kg) Maris Otter pale malt extract syrup for Maris Otter malt and 1 lb. (0.45 kg) dextrose for flaked maize. Dissolve extract and sugar completely in RO water and top off to desired boil volume. Proceed as above.

It is rumored that Irish craft brewery Carlow uses Natty for its O'Hara's Irish Red, which is one of the better commercial examples of the style available today. Just remember this strain will throw a lot of esters if fermented any higher than 64° F (18° C). Fortunately it's very cold tolerant—you can go as low at 57° F (14° C) and it will give you a clean, lager-like result, which would be quite appropriate for this beer. Finally, you can use Continental lager yeast if you want to brew something more in line with mega-brewery reds, but my feeling is that Irish red ales should, in fact, be ales.

Maris Otter makes a fine, malty, biscuit-and-cracker base malt and should be top choice for the style, but Golden Promise or Optic could also add interesting dimensions. This beer is really a base malt showcase style, despite the small component of black or roast, so feel free to experiment with local craft malts if they are available. As previously stated, Vienna malt can deepen base malt character. Munich makes things a bit too toasty.

Caramel malts aren't really necessary for this recipe to work, but a few ounces of 75 to 120 Lovibond will help with the red color and fill out body and sweetness a bit. (Smithwick's also produced a moderately strong barleywine at one time, which Jackson mentions was brewed with caramel malt. Fans would take a 12-ounce serving of the draft ale and then top it off with barleywine, calling the blend a "barley fillup.")

The 3 to 4 percent roast should be 500° L. If you only have 300° L available, go with 5 or 6 percent. Black, Carafla, or even Midnight Wheat can be substituted in a pinch; with such a small role to play, there shouldn't be much difference, though my personal opinion is that English 500° L roast lends a truer red color and authentic flavor to the style. The Beer Judge Certification Program (BJCP) limits color to 14 SRM, which is medium amber-red, not garnet. Those who want more roast character should crunch the numbers with brewing software before settling on a recipe.

A bit of corn adjunct lightens the body, adds a pleasant, round sweetness, and is true to the early Smithwick's flavor profile,

but all-malt Irish red is perfectly to style if you'd rather skip the adjunct. Extract brewers should make an effort to find Maris Otter malt extract for the base to get the right malty flavors and substitute corn sugar for flaked maize—that will allow them to hit the proper finishing gravity.

Hops should be floral and low alpha. Mt. Hood, Willamette, or Crystal will all work, but Fuggles and East Kent Goldings are more authentic and truer to style. Some like a late addition to add a more obtrusive aromatic component, but that is more in

keeping with Americanized craft Irish red.

Brew up a batch of this easy-drinking ale for St. Patrick's Day (though this is really an American holiday), and see how well it goes with corned beef and cabbage!

Resources

Jackson, Michael. *Michael Jackson's Beer Companion*, Duncan Baird Publishers, 1993.

Amahl Turczyn is associate editor of Zymurgy.



HOME BREW GADGETS

By Zymurgy Readers

The *Zymurgy* Gadgets issue is an annual celebration of the do-it-yourself nature of homebrewers. If a piece of equipment isn't working for them, they'll often tweak it, build something from scratch, or find a homebrew-related use for household appliances or parts.

Every year, *Zymurgy* readers write in to tell us about the cool toys they've built, and we're proud to showcase more in this, the 12th annual Gadgets issue. There's a gadget here for every budget and every ability. Some are simple, elegant solutions that require nothing more than rearranging items you already have into something more useful and interesting. Others are complex builds that demand a bit of elbow grease and some technical know-how. All of them are guaranteed to help you brew and serve better beer.

Thank you to all who submitted gadgets this year, and keep sending us your stories for the 13th annual issue. And, be sure to check out HomebrewersAssociation.org for more great gadget ideas.



1

WORT SAMPLE CHILLER

I've been a homebrewer for 17 years and have always struggled to find a good solution for taking gravity samples during the boil. I prefer using a hydrometer, but various chilling techniques weren't getting the sample cool enough to take an accurate hydrometer reading. By the time the sample had cooled, I would already have boiled off another 5 gravity points or more. But when you boil to gravity rather than volume, it is important to take periodic readings to check on gravity.

This chiller uses simple heat transfer and gravity to quickly cool a sample of wort for taking hydrometer readings during the boil. It cools wort from boiling to 72° F (22° C) in less than 15 seconds so you can stop boiling close to your target gravity.

Simply fill the insulated dispenser with tap water—and some ice if your water is warm—and re-attach the lid and funnel. Make sure the faucet is closed, and pour hot wort through the funnel. Open the faucet, fill your hydrometer sample jar, and take a reading. In between gravity samples I also run a sanitizing solution through the coil to make sure I don't transfer unwanted sugars.

This idea and design is inspired by Will Landry, head brewer at Chaos Mountain Brewing in Roanoke, Va. I adapted his design and made a few improvements.

**JOE DARDEN • South Riding, Va.
50 West Homebrew Club**



WORT SAMPLE CHILLER PARTS LIST

Total cost about \$50

- 2-gallon (7.6-liter) insulated beverage dispenser
- 20 feet (6 m) of 3/8" outer diameter copper tubing
- beer faucet or other valve
- funnel
- short length of silicone tubing
- assorted washers, fittings, and hose clamps

2

CUSTOM CANNING STATION

I had been eyeing a canning setup and researching canning methods for some time, and I finally decided to move forward with it. I went with the MK16 seamer from Oktober. They sell all you need to get up and running: the seamer, cans, lids, and holders. I designed my own labels and purchased cans directly from a can manufacturer.

After acquiring all the pieces I needed, I set up a “fill station.” I started by fabricating a shelf for the cans to sit on as they were filled. Then I added a 1/2" T-fitting to the side of the MK16 in which my beer gun could rest to support one-handed operation.

Filling the cans isn't super fast, but it's quick enough. The beauty of cans is that once packaged, you will have no oxygen ingress, much like a keg but with the mobility of bottles (without oxygen ingress from the cap). Once you get the methods down, it's pretty easy, and let's not forget how cool it is to see your beer in a can!

BRYAN RABE • Hanover, Minn.
River City Brewers



To read more about Bryan's canning station, go to HomebrewersAssociation.org/Jf18 and follow the link!

3

DESCRIPTIVE BOTTLE HOLDERS

I have only been brewing for a couple of years now and have had enough with storing my bottles in the flimsy cardboard boxes they came in. I decided to build wooden crates. To improve the crates a bit more, I took an idea from my wife's DIY crafting projects and painted each end with chalkboard paint. This allows me to write all the pertinent information on what is currently in the crate and then erase it when I reuse the crate for another brew. I have made two sizes: one holds twelve 22-ounce bottles, while the other holds twenty-four 12-ounce bottles.

DAVID BUCKNER • West Valley, Utah



4

HANDS-FREE BOTTLER

To free up our hands during bottling, we created a sliding framework that holds a counter-pressure bottle filler. It fits all bottle sizes and shapes, including growlers, and allows you to cap, sip, or whatever else you need to do while the bottle is filling.

PRESTON ANDREINI
Fillmore, Calif.



5

CHEAP & EASY INSULATION

I needed insulation to go with the thermoelectric fermentation chiller *Zymurgy* published in the 2016 Gadgets issue (Jan/Feb). The fabric had deteriorated on several old lawn chair cushions, so I removed the fabric, and the inner padding seemed to be a compressed polyester, which dries quickly and is a high quality insulation.

This material can be made from recycled plastic bottles and pops back into shape after being compressed. The R-value (thermal resistance) for 3.5" of polyester is 13, so I expected this 2" thick material to be about R 7.4.

I joined a couple of pieces together using clear silicone to get the length I needed to wrap around my stainless conical (the padding cuts quite easily with scissors if it needs trimming). I covered the padding with white plastic garbage bags that fit quite well when I taped them together with packing tape. I made a few belt loops with packing tape to hold 48" (1.2 m) flat bungee cords in place on the conical.

I plan to make a round piece to cover the conical top using some old 3" thick chair cushions as well.

GARY SCHWARTZ
Kelowna, B.C., Canada
OkBrewers



6

FRUGAL HOP SPIDER

Why spend dollars on gear that you could put towards ingredients? This is a simple twist on the hop spider. It works well and costs about as much as a burger and fries. Start with a muslin bag that's long enough to reach from the rim of your brew kettle to the bottom. Next, get three "bulldog" binder clips. Place two of them on opposite sides of the pot, and keep the third handy for a moment.

Now you need a length of rod, ideally 1/4" inch in diameter and a couple of inches longer than the diameter of your pot. I used an aluminum rod from my home center. When making your choice, it must be able to hold your hops securely as they impart their goodness to your wort. It must also be impervious to the hot steam.

Place the rod through the shiny metal ends sticking above your pot. Place your hops in the muslin bag, then clip it to the rod using the third binder clip. This fully functional hop spider can save you enough to pay for your next batch.

TOM GOFFE • Smithfield, N.C.



7

SPARGE ARM SWIVEL

When I finally made a plan to use a decommissioned keg as a mash tun, I took advantage of the center-line dip tube I was no longer using in my boil kettle. After finding the right combination of elbows and MFL/MPT fittings, I used a swivel elbow I found on Amazon. I've since sacrificed some mash volume for a better false bottom, but that actually makes my sparge a little less turbulent. The arm swings left or right to make grain removal a little easier. Once I remove most of the grain from the top, I take out the false bottom and flush the remaining grain out the 2" drain port.

BRIAN HICKEY • Asheville, N.C.



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DIY GLYCOL CHILLER

I built a glycol chiller from an air conditioner unit and an insulated beverage cooler. I know I'm not the first to build one of these, but I think I made it look pretty sexy. For less than \$300, it's an easy weekend build for fantastic temperature control.

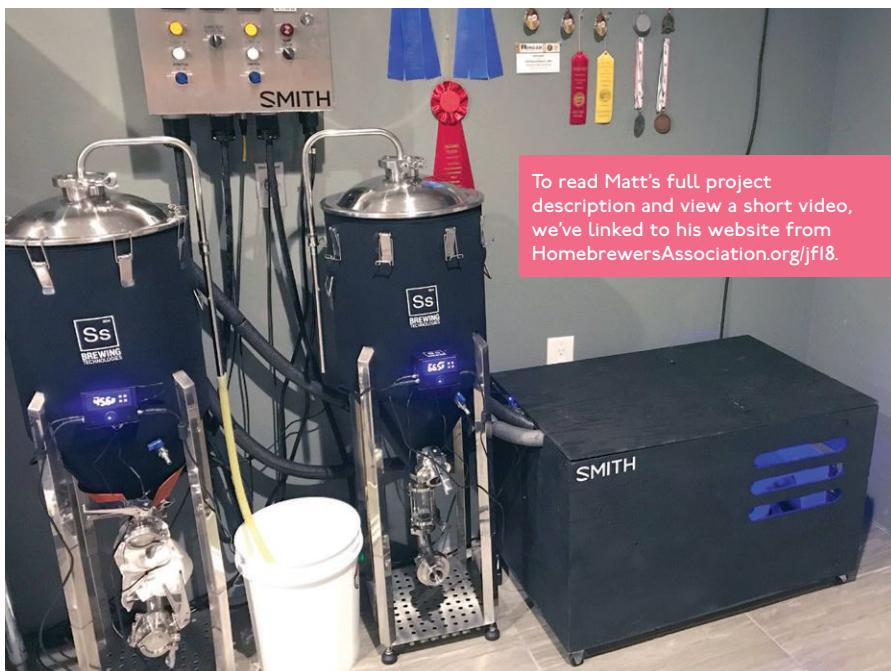
The project involves partially disassembling a window air conditioner, bypassing the thermostat, and repositioning the condenser (you'll definitely void the warranty) so that the air conditioner cools a glycol reservoir instead of ambient air. I built a simple box for mine out of plywood and attached some casters so I could wheel it around the brewery. To make it look super cool, I even added some LED lights (they change color too).

DIY GLYCOL CHILLER PARTS LIST

Total cost \$260

- | | |
|--|--|
| <input type="checkbox"/> Window air conditioner | <input type="checkbox"/> Casters |
| <input type="checkbox"/> 52-quart (49.2-liter) insulated beverage cooler | <input type="checkbox"/> Expanding foam |
| <input type="checkbox"/> Plywood | <input type="checkbox"/> 2 gallons (7.6 liters) propylene glycol |
| <input type="checkbox"/> Paint | <input type="checkbox"/> LED lights |

MATT SMITH • Monroe, Wash.
The Brewing Network



CHILLING BY THE POOL

When I lived in the desert of Palm Springs, Calif. during a drought, it was tough to justify the runoff down the curb from my copper coil wort chiller. What would the neighbors think? I had a xeriscaped yard and not much need for plant watering. So I bought a pool sump pump that dropped to the bottom of the deep end of the swimming pool.

I pumped pool water from the cool deep end of the pool and through a coil immersed in an ice bath bucket that connected to the immersion coil in the wort. The warm pool water exited the chiller in the wort and dumped into the warmer, shallow end of the pool. No water used at all, just recycled.

There may be concerns about using pool water in a plate chiller, as the plates won't respond well to high chlorine levels. But, in a copper coil it worked quite nicely.

J.C. KEMMER • Stuart, Fla.
Treasure Coast Brewmasters Club

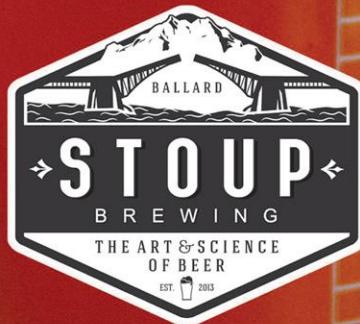


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CUSTOM BLOWOFF & SPARGE

I got tired of losing batches of beer when an aggressive fermentation would pop the rubber stopper out of the carboy lid during primary fermentation. So I devised an airlock system that can't be blown out. The O-ring seats on a flange on the underside of the carboy cover. With this method, the higher the pressure, the better the seal. Problem solved!

I also could never find a robust fly sparger that I liked, so I built one from a quick disconnect, some high temperature tubing, a piece of Plexiglas®, and a 6-hole stainless steel sprinkler head that I machined. My original gravity has increased by 10 to 15 gravity points with this system. I'm very happy.

BRETT THUNSTROM
Zimmerman, Minn.



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11

EASY PICKINS!

I built a hop trellis from two pieces of 1-1/4" plastic pipe joined by one 1-1/4" connector for easy disassembly during hop harvest! Best suited for one variety of hop, it's a good solution for a small yard.

KENNY GRALEY
Charleston, W.V.
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Homebrewers Association



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OVERFLOW PREVENTION

I own Brew-Boss and ran a brew-on-premises (BOP) operation for about a year and a half. To save time, we'd heat our strike water for brewing in our Brew-Boss systems prior to the arrival of the customers. We knew each customer's batch size and usually knew the recipe, so we knew how much strike water to heat.

The problem was that we needed to fill multiple Brew-Boss kettles and would often put the water hose in a kettle to fill it then walk away to do other tasks. Inevitably, we'd get tied up and forget to check on the kettle, only to be reminded by the sound of water splashing all over the floor! I no longer run the BOP, but I saw a need for an accurate electronic filling device.

I've created a device that mounts directly to the Brew-Boss accessory port, or it can be clamped onto the side of any brew kettle. It is an electronically controlled flow sensor with an electric valve and an LED display that lets me specify how much water I want in the kettle to within 0.1 gallon (0.4 L). I attach a garden hose, turn on the water, and press the start button on the controller. The device opens the valve, fills the kettle until the specified volume has been dispensed, and then automatically stops filling. I even added a float sensor that detects if something went wrong (like entering the wrong volume), and shuts off the water before the kettle overfills!

DARIN DANESKI
Oconomowoc, Wis.



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BREW CART

This is my brewing cart. The hot liquor tank is on the left, from which water is pumped to the mash-lauter tun (MLT) on the second level. From there, wort is gravity fed from the MLT to the brew kettle and then on to the fermentation vessel.

I wired a switch up high to control the pump while on a step stool, which makes it easy to shut off the pump when the desired water level is reached. Even after several brews, I can't find anything I'd change.

JASON EVANS • Bel Air, Md.



CUSTOM MILL FUNNEL

I bought a cheap Corona mill a few years ago, but it didn't come with a cover. I struggled to figure out what to do as I played with old milk jugs and sheet metal, and then I discovered I had access to a 3-D printer. These can print complex shapes in a variety of plastics, and with the advent of the Maker community, they have become fairly cheap. Many public libraries even have 3-D printers now, and some allow free or low-cost printing.

I took a few dimensions, modeled something up, and six hours later, I had a custom cover. Not only does it keep the dust down, but it funnels milled grain into a bucket. The best part? Anyone can print it, without 3-D modeling experience or even much 3-D printing experience. I've used it for 16 batches with no issues.

WILL BAAR • Peoria, Ill.
Homebrewers of Peoria



PORTABLE GLASS RINSER

Ever have to pour your homebrew at a picnic, brewing competition, or meeting where tasters are sampling many different styles in the same glass? I don't know about you, but I don't want someone else's beer remnants affecting the flavor of the beer I am pouring. This portable glass rinser is the perfect solution and uses the same principle as the glass rinsers that many breweries use.

PORTABLE GLASS RINSER

Total cost about \$75.

You'll need some basic tools like an adjustable wrench, pliers, and screwdrivers. Tin snips and a drill are helpful for cutting out and making holes in the lid, respectively

- | | |
|--|---|
| <input type="checkbox"/> 1-gallon (3.8 L) beverage cooler
<input type="checkbox"/> Glass rinser spray assembly
<input type="checkbox"/> 3/8" beverage tubing | <input type="checkbox"/> Ball lock valve and adapter
<input type="checkbox"/> Assorted fittings, clamps, and washers |
|--|---|

To make it work, you need a pressurized keg of water. I use spring water with a very small amount of sanitizer, which I pressurize to 25 psi. The rinser connects to the keg's liquid-out post.

I am currently trying to come up with a solution for the fact that the cooler fills up with water and beer residue and must be periodically emptied. This design is inspired by Adrian Widman, owner and brewer at Ocelot Brewing Company in Dulles, Va.

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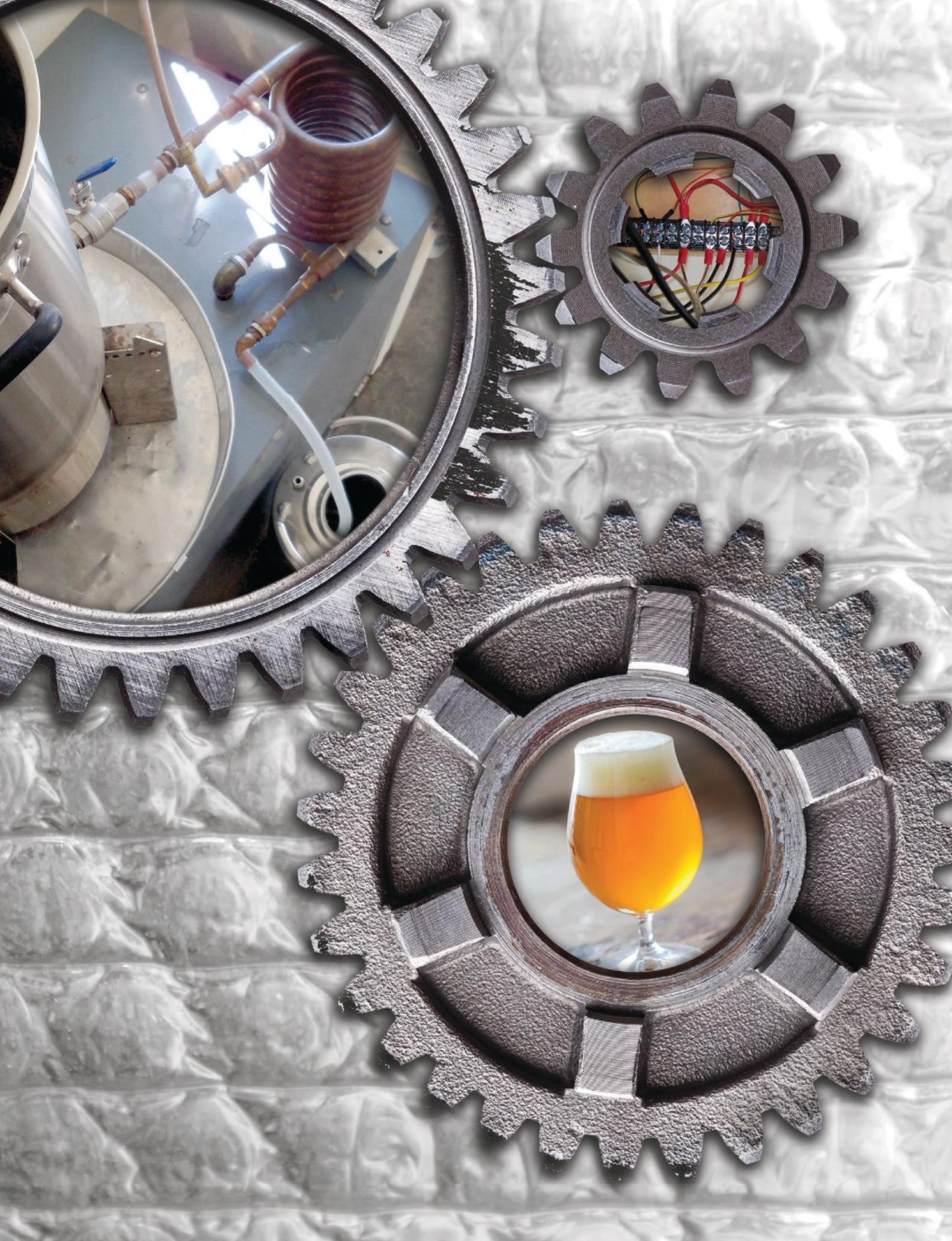
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Brewing Automation:

Homebrewing Meets the Internet of Things

By Martin Bradley







Cleaning station



Grain and hops preparation

Over the past year, I have automated my mashing process in an attempt to improve recipe repeatability. My goal is to control a single-step mash to within $\pm 2^\circ \text{ F}$ (1.1° C) with minimal intervention. To accomplish this, I use a microcontroller to adjust the heaters, pumps, valves, and timers that control the mash. My system is based on the “internet of things” (IOT) model, a term that describes multiple devices communicating with one another using standard internet infrastructure.

Safety First

Warning! There is always a risk of electrocution when water and electricity are both present. I don't use electrical cords on the floor since my brewery is notorious for spills and has a dedicated 240-volt, 40-amp circuit. Furthermore, every electrical outlet is equipped with a ground-fault circuit interrupter (GFCI), which is a safety device that shuts off a circuit when a small amount of current leaks to ground. Such outlets are commonly used in bathrooms to prevent people from being electrocuted.

There's also a fire extinguisher, which, fortunately, I've never had to use.

Technical Details

Secure web communications are essential for successful IOT projects. I don't want hackers taking over my microcontrollers to carry out attacks against other people's computers. Secondly, I don't want to compromise my home network by plugging in an unsecure IOT microcontroller, which could inadvertently let hackers into computers on my home network (think

ransomware). And I certainly don't want hackers to be able to power up my brewery remotely and burn down my house!

(Actually, there is no danger of someone remotely burning down my house because I turn off the dedicated circuit breaker after every brew day.)

I chose a 32-bit, power-efficient Kinetis K64F microcontroller featuring an ARM® Cortex®-M4 core running up to 120 MHz, although other microcontrollers like an Arduino or a Raspberry Pi could be used. The microcontroller operates standalone. The brewery microcontroller only needs to connect to my home network's router and get an IP (Internet Protocol) address, just like any other tablet, phone, or computer.

The microcontroller runs a web server that allows up to five clients—tablets, computers, or phones—to connect. I can easily use my tablet as the brewery control panel; the tablet's web browser just needs to navigate to the microcontroller's IP

address. The microcontroller's web server then returns the brewery control panel web page to the tablet. This allows the microcontroller and tablet to constantly communicate back and forth over a secure connection, allowing me to monitor the brewery in real time.

Since the web server runs on the microcontroller I don't need external services like Amazon or Azure to run the brewery. Some IOT devices do require that you subscribe to online services or brokers in order to operate, and some such services require a monthly fee. My system is free to operate since it doesn't require any online services or brokers.

Microcontrollers are different than desktop computers in that they can't just wait arbitrary lengths of time while other processes complete. If I need to measure a mash temperature every second, it needs to be exactly one second every time. To accomplish this, a real-time operating system (RTOS) lets the microcontroller run multiple processes in parallel while interacting with the



inputs and outputs and communicating with connected clients all in real time.

Because my software is scalable and I have intentionally considered interoperability between brewing components, this approach can be used to build any size brewing system. For example, I currently use DS180 digital thermometers, but I could substitute thermocouples or Bluetooth temperature sensors in the future.

The brewery control panel is a web-based user interface (UI) that replaces mechanical push buttons and potentiometers to simplify wiring and reduce cost. It runs in a web browser on a computer, tablet, or phone. There is no additional expense since I use my existing mobile devices to control the brewery.

The microcontroller runs timers that all connected clients can see. For example, if my tablet becomes disconnected from my home network, I only have to log back into the control panel to easily resume where I left off. The timers continue to run even when the tablet is disconnected.

The boil kettle control panel displays the minimum, maximum, and current temperatures. The kettle itself is a manually controlled propane burner. I have designed the brewery so processes can run concurrently. For example, a second

mash can take place during the first boil. This requires good planning and timing.

While brewing I continually find myself looking at the control panel to see all the temperatures and timers. Using a tablet, computer, or phone as the brewery interface makes it easy to see all of the information in one place.

A Semi-Automated Brew Day at Sugarloaf

I can make 12 gallons (45.4 L) of wort on a good day. The mash tun and boil kettle are drained by gravity, and two high-temperature pumps control the water supply and recirculation for the hot liquor tank.

Prior to brew day, I make a yeast starter, prepare brewing water, measure out hop additions, and measure and crush grain.

Cleaning and Sanitizing

Cleaning and sanitizing are important, so I built a dedicated cleaning station with a detergent sink, a rinse sink, and a sanitize sink. The rinse and sanitize sinks have switch-controlled recirculation pumps. Prior to brewing, I lightly clean and sanitize the kettles, valves, silicone tubing, etc., and I use the sanitize recirculation pump to circulate sanitizer through the wort chiller.

I boil 2 to 3 gallons of water in the boil kettle and drain the boiling hot water out



through the counterflow wort chiller. This boiling water sanitizes the boil kettle, boil kettle drain valve, silicone tubing, and the counterflow wort chiller. Note that the copper counterflow wort chiller gets very hot to the touch. I use silicone tubing throughout the brewery, which can withstand high temperatures and be sterilized in boiling water.

Mashing

Next I set up the brewery and controls through a series of steps to ensure that all temperatures are accurately read. Then I wait for the hot liquor tank and mash tun temperatures to stabilize at the desired setpoint before starting the mash. The

Hot liquor tank, mash tun, and control panel



Gravity-powered runoff to boil kettle

SLF Pale Ale

Batch Size: 6 US gal. (22.7 L)

Original Gravity: 1.059 (14.4 °P)

Final Gravity: 1.012 (3.3° P)

Bitterness: 27 IBU

Alcohol: 6% by volume

Boil Time: 60 min

Malts

12 lb. (5.44 kg) 2-row malt

12 oz. (340 g) Vienna malt

8 oz. (227 g) Dark Munich malt

8 oz. (227 g) Victory malt

Hops

0.5 oz. (14 g) Magnum,
12% a.a. @ 45 min

0.5 oz. (14 g) Centennial,
10% a.a. @ 15 min

0.2 oz. (5.6 g) Cascade,
6% a.a. @ 15 min

1 oz. (28 g) Centennial,
10% a.a. @ 0 min

0.3 oz. (8.5 g) Cascade,
6% a.a. @ 0 min

Yeast

Imperial A01 House (2 L starter)

Brewing Notes

Ferment at 67° F (19° C).

stainless hot liquor tank fill limit switch automatically shuts off the water supply pump when the hot liquor tank is full, thus preventing overfill.

The mash tun has a variable speed rake that stirs the mash. I can turn the mash rake on and off from the control panel, and the speed is manually controlled using a potentiometer. I can also assist the mash rake by manually stirring with a mash paddle as needed.

The mash tun temperature sensor is located in a thermowell under the false bottom.

As needed, I can check the mash temperature with a handheld probe near the top of the mash. I can also add hot water to the mash tun using the control panel, but the goal is to maintain a constant temperature throughout the mash cycle using the mash rake to stir the mash with some added heat from the mash tun heater.

During a 60-minute mash, I don't do much other than monitor the process and (optionally) prepare for a second mash.

Vorlauf, Sparge, and Boil

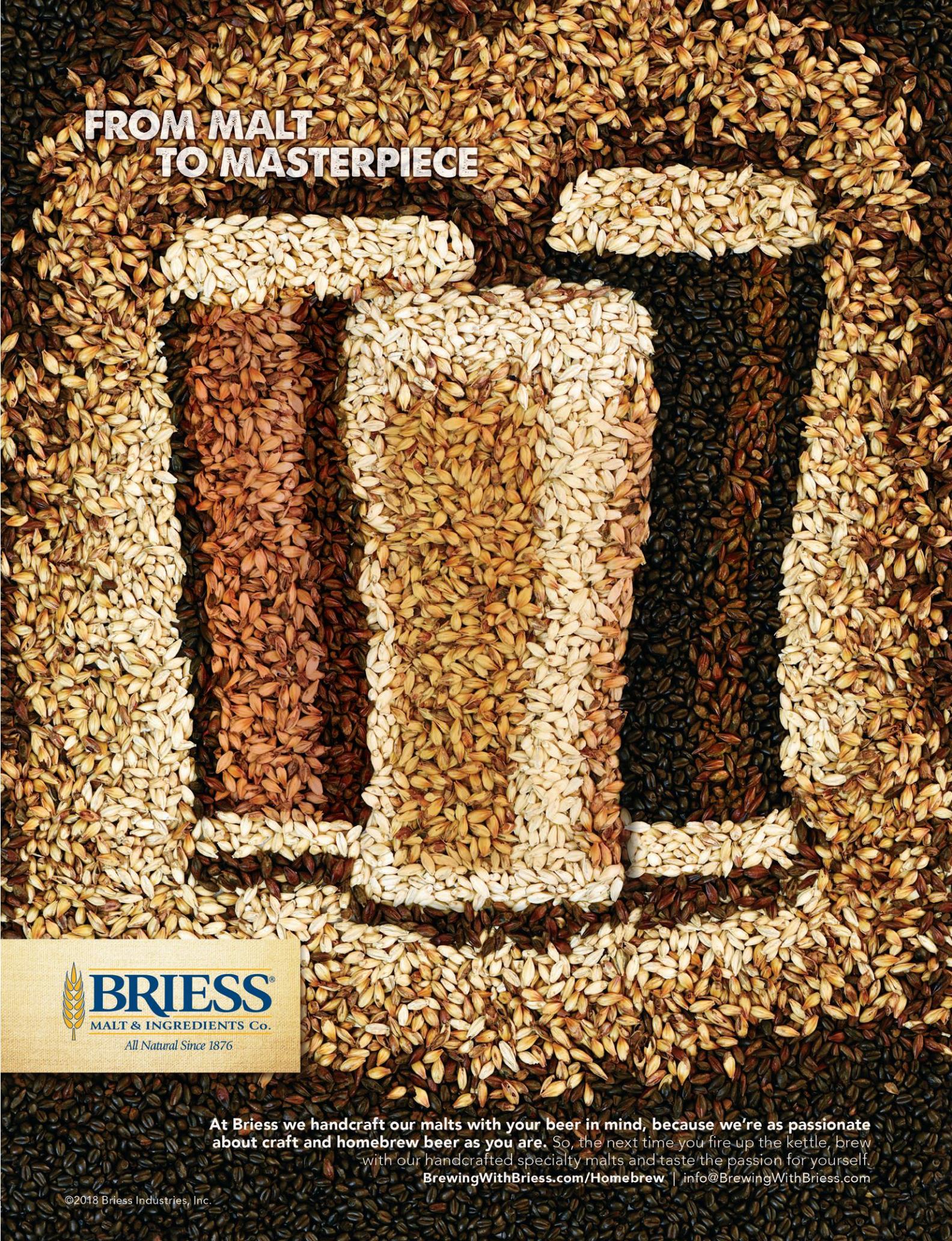
I conduct a manual vorlauf by adjusting

the mash tun drain valve to the desired flow rate and running off until the wort runs clear. Then, I manually adjust the mash tun drain valve to achieve the desired flow rate and divert the flow to the boil kettle. I carefully monitor this so that flow rate of incoming sparge water matches the flow rate of the outgoing wort as is customary.

As soon as the desired amount of wort has drained into the boil kettle, I light the boil kettle propane burner, wait for a good boil, and start the timer on the control panel. Then I just add hop additions at the appropriate times while manually stirring the boil as needed.

If an optional second or third concurrent mash is planned, I remove the mash rake and temperature probe from the mash tun and dump the spent grain. Then I reassemble the mash tun and start the next mash during the boil. If I want to conduct another boil, I only need to clean the trub and hops out of the boil kettle.

The ability to run concurrent mashes and boils with minimal user intervention is a great benefit of automation. If I'm prepared for a typical brew day, I can easily conduct two mashes and boils for a total of 12 gallons (45.4 L) of finished beer. When you brew multiple batches, you get more beer from a single brew day, and you only need to set up and clean up once.



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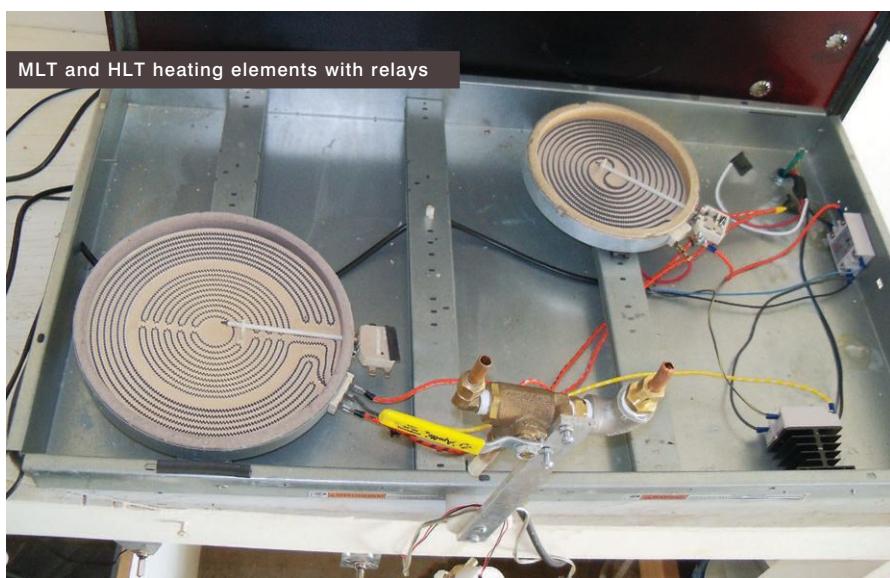
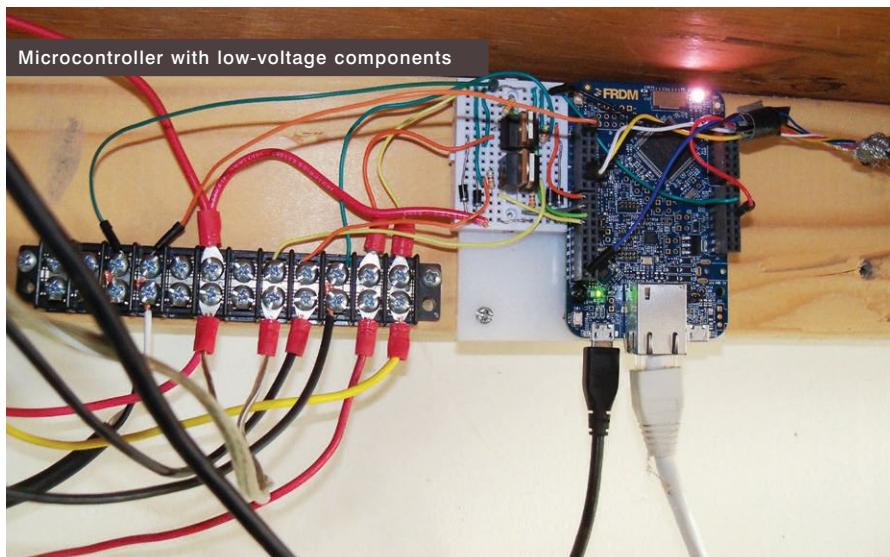


After the boil or boils are complete and the chilled wort has been safely transferred to the fermenters, I completely clean, rinse, and sanitize everything used to brew and stash it away for the next brew day.

Future Enhancements

As a future enhancement, I hope to conduct analytics to help improve my brewing process. To accomplish this, I will probably need my microcontroller to communicate with Amazon or Azure web services. A few of the future enhancements I would like implement include:

1. Plotting temperature vs. time in the user interface so I can visualize the temperatures over the course of a brew day.
2. Building a grant into the mash tun drain with a wort recirculation pump for automated vorlauf.
3. Importing recipes using the user interface.
4. Adding audible alarms to be notified, for example, when a temperature goes outside of a specified range.
5. Using the microcontroller to run the water pumps at variable speeds.
6. Adding temperature control to the boil kettle. This is more difficult with a propane burner than with electric heaters, so for now, it is easier for me to manually control the boil kettle propane regulator.



Some brewers I know don't really like automation, and they still brew great beer! I wouldn't necessarily say that automating my homebrewery has made it "easier" to brew—in many ways, brewing has become more complex. A good checklist is important to make sure things operate as intended, but so far I have achieved my goal of improving repeatability from one brew day to the next.

Resources

Vorto: eclipse.org/vorto/

Video of brewery in operation:
youtu.be/6JlWbMpbgHQ

ARM online compiler:
developer.mbed.org/handbook/mbed-Compiler

Martin Bradley is an electrical engineer who lives in Nederland, Colo. To learn more about the hardware and methods he uses to automate his homebrewery, contact him at mbradley@bruiot.com.

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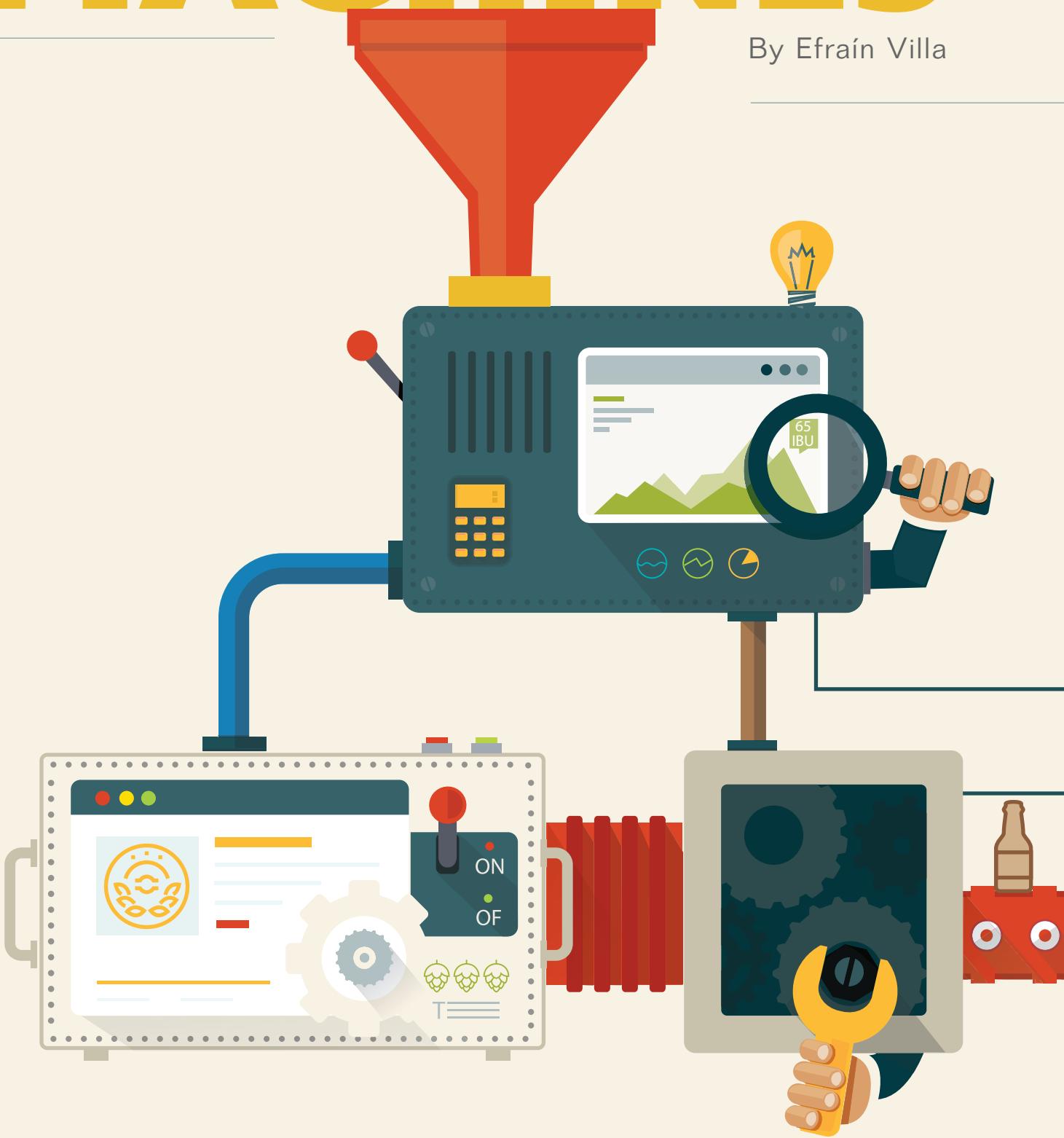


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LESAFFRE FOR BEVERAGES

RISE OF THE MACHINES

By Efraín Villa



"THAT GUY AT THE BOOTH SAID YOU LITERALLY JUST HAVE TO PRESS A BUTTON AND YOU'LL HAVE FRESH BEER BY THE END OF THE WEEK," AN EXCITED WOMAN TELLS HER GROUP OF FRIENDS AS THEY MEANDER THROUGH THE CROWDED HALLS OF THE GREAT AMERICAN BEER FESTIVAL (GABF) IN DENVER, THE LARGEST TICKETED BEER FESTIVAL IN THE WORLD.

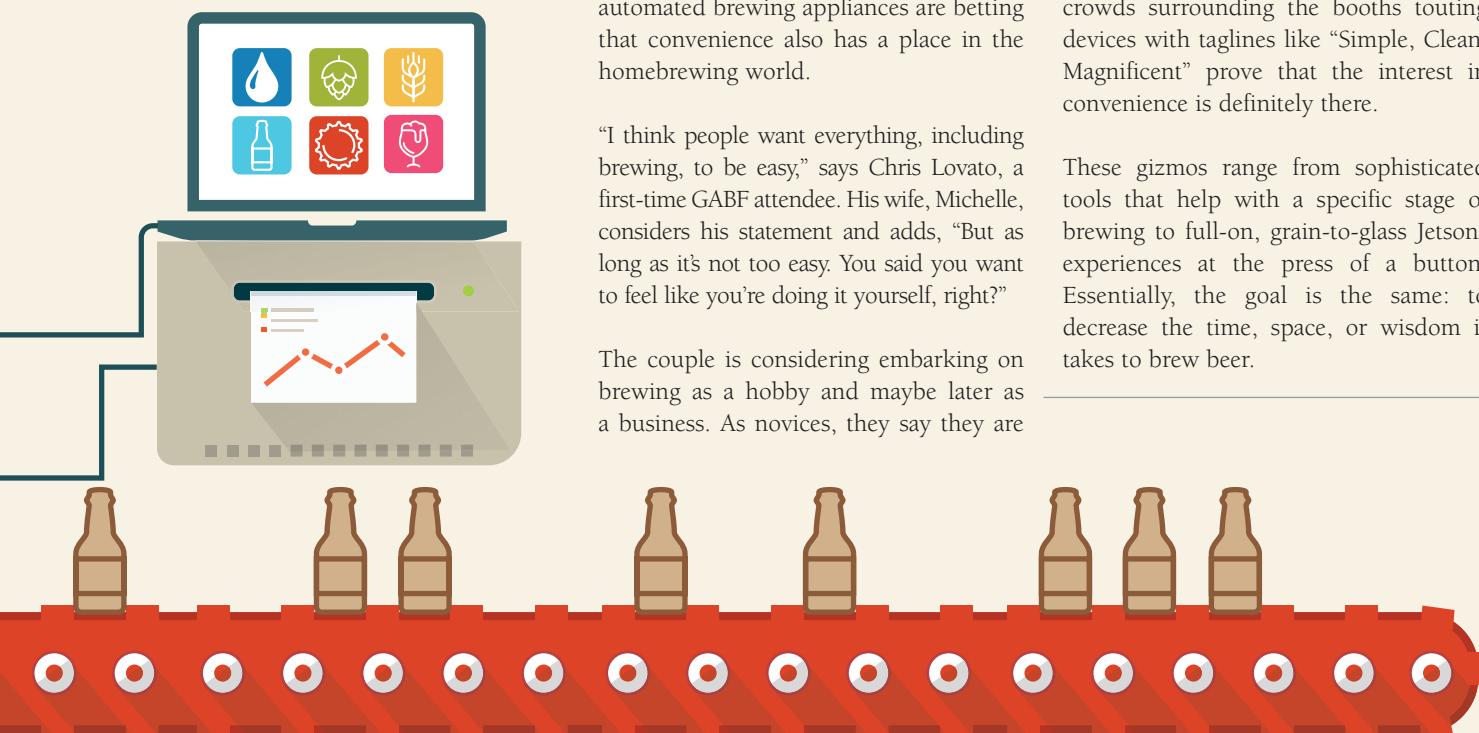
Among the throngs of cheery beer guzzlers, representatives of companies developing the latest innovations in craft brewing gadgets showcase their wares to fascinated potential customers. In a crowd that prides itself in appreciating the artisanal qualities of beverages produced through blood, sweat, and tears (as well as barley, hops, yeast, and water, of course), the makers of automated brewing appliances are betting that convenience also has a place in the homebrewing world.

"I think people want everything, including brewing, to be easy," says Chris Lovato, a first-time GABF attendee. His wife, Michelle, considers his statement and adds, "But as long as it's not too easy. You said you want to feel like you're doing it yourself, right?"

The couple is considering embarking on brewing as a hobby and maybe later as a business. As novices, they say they are

concerned about relying too much on technology. Chris has already determined that he will likely buy an "old-fashioned" brewing kit and have his cousin, an experienced brewer, help him with his first couple of batches. "I know that even some breweries use those types of machines, but I want to really learn brewing," he says. "I don't want a machine to rob me of that satisfaction." Although Chris and Michelle might not see themselves as part of the target market created by the brewing automation progression, the large crowds surrounding the booths touting devices with taglines like "Simple, Clean, Magnificent" prove that the interest in convenience is definitely there.

These gizmos range from sophisticated tools that help with a specific stage of brewing to full-on, grain-to-glass Jetsons experiences at the press of a button. Essentially, the goal is the same: to decrease the time, space, or wisdom it takes to brew beer.



HERE IS A RUNDOWN OF FOUR OF THESE INNOVATIVE DEVICES



PICOBREW MODEL C

APPROXIMATE COST: \$350

PicoBrew is what happens when the former vice president of Microsoft and his brother get together with an inventor and the 2013 recipient of the American Homebrewers Association's Homebrewer of the Year Award.

"When I left Microsoft, one of the obvious things to do was bring software and process control and repeatability; the kind of stuff you have with 3-D printers," Bill Mitchell, CEO of PicoBrew, yells into my microphone over the hooting of nearby GABF-goers. "I wanted to bring those attributes to beer processing equipment and allow everyone to be able to recreate their own recipes. Because if you build something awesome, you should be able to do it again and again and share it with people."

In 2010, Mitchell founded the company that for the next seven years would launch several Kickstarter campaigns focusing on beer automation solutions, the latest of which yielded the PicoBrew Model C.

"The PicoBrew Model C Kickstarter lasted from the second week in April through May, so about a month," says Mitchell. "We got better than funded; we did the best-funded Kickstarter feed campaign of all time, out of 640,000 Kickstarter campaigns. What it tells you is people really want to homebrew."

So exactly what was the vision that so many people bought into?

The PicoBrew Model C is a countertop machine that uses prepackaged packets called PicoPaks (purchased on the company's online Brew Marketplace for \$19 to \$30) to crank out almost-exact replicas of some of the world's most famous, award-winning beers.

During brewing, the machine requires little in the way of human assistance—even the water amendments are premixed. After pouring water into the receptacle and inserting

the packets of grains and hops, which the device automatically adds at the appropriate times, the PicoBrew is ready to work its magic. Users have the option to adjust the IBU and ABV values with a knob before starting the machine, but other than that, there's nothing left to do but wait approximately two to three hours.

To ferment the wort, an included yeast packet is added, which corresponds to the type of PicoPak being used. A temperature decal indicates at which temperature the keg should be kept in order to properly ferment the wort. The included keg cozy helps with temperature control, and Mitchell says backpressure in the system grants some leeway in temperature regulation. Complete fermentation takes from four days to two weeks, depending on the type of beer.

Once the amount of time on the decal has passed, the keg is put into the refrigerator to cold crash the yeast. If the recipe requires dry hopping, the packet of hops is added into the keg at this time. From there, the contents are racked to a dispensing keg, and an included sugar pack is added to carbonate the beer. Natural carbonation can take twice as long as fermentation.

When all is said and done, the entire process takes around three weeks and yields 5 liters of beer. PicoBrew also sells additional kegs to brew multiple batches in addition to products that allow for forced carbonation. Mitchell says they are currently working on ways to speed up the fermentation process.

So, it is not completely effortless, but it is quite simple. A homebrewing network on Pico's BrewMarketplace lets new users of the Pico mingle with more seasoned brewers, and the platform also lets customers customize their recipes through a "freestyle" option (ingredients must be selected from what is available on the platform). A portion of the proceeds from freestyle recipes created from scratch and sold on the BrewMarketplace compensate the beer's original creator with a residual commission.



MINIBREW

APPROXIMATE COST: \$1,200

The MiniBrew, currently in beta testing, can be preordered online before its scheduled release to the European market in the second half of 2018. Similar in scope to the PicoBrew but with a more prevalent online component, the MiniBrew also boasts a design that fully automates brewing, fermentation, and temperature control in one receptacle.

The whole process begins with an app. “In the app you discover what recipe you want to use,” says Bart van de Kooij, one of the founders of MiniBrew. “Every recipe is split into three parameters: the color, the alcohol percentage, and the taste. You choose one and then you order the box with ingredients (malt, hops, and yeast) and that same app tells you what ingredients go where. Then you just hit ‘play’ and the machine does the rest.” At launch, customization of recipes will be limited, but the MiniBrew team hopes to soon expand to a fully customizable platform.

Because the interface of the MiniBrew does not utilize premade packets, users will have to literally get their hands dirty—or at least wet—when initially mixing the malts with water prior to inserting them into the machine. From there, software in the MiniBrew utilizes cloud technology so users can monitor the brewing process of up to 5 liters of beer.

“We’ve put sensors into the machine,” says van de Kooij. “The machine is connected via Wi-Fi, so it sends data back and forth to the cloud.”

Although having a smart mini-brewery on your kitchen countertop is pretty cool,

the most important innovation of the MiniBrew is its ability to fully automate the fermentation process after brewing is complete.

“In terms of brewing machines that claim to deliver ‘fully automated home breweries,’ they all forget a critical step: fermenting,” says Patrick Layer, Lead Acquisition & Growth Specialist at MiniBrew. “Although others also go through a fermentation process, it is manual and not fully automatic. This might work for some who have knowledge and want to play with fermentation time and carbonation levels, but with MiniBrew the whole fermentation process is covered and fully automatic due to our smart keg with temperature control. In addition, since we boil, ferment and tap from the same keg there is nearly no possibility to infect the beer.”

The keg also has a CO₂ adapter, and the temperature settings allow users to keep the beer fresh while it is served. The downside to having the machinery fully integrated into the keg is that your MiniBrew is essentially out of commission until you are able to drink up all your beer.



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THE GRAINFATHER CONNECT

APPROXIMATE COST: \$1,000

In terms of sophistication, the Grainfather Connect is probably more airplane than starship, but that could be part of its appeal to homebrewers.

"Our system is still about brewing all the grain yourself, and you're still designing your recipe from scratch," says Trent Slater, marketing and digital specialist at Imake, the New Zealand-based parent company of The Grainfather. "You're still brewing craft beer the way it was supposed to be brewed. There are just a couple of paths that can save you some time. For the new guys, it can also help them before they gain competence and really go out and delve into doing their own thing."

This is definitely not a plug-and-go model. Assembly and at least some basic know-how are required. The Grainfather Connect allows brewers to manually mash, sparge, and boil 5-gallon (20-liter) batches in a single vessel. The control unit can synchronize recipes from an app through Bluetooth in order to walk brewers through the brewing process, but its capabilities end there. The Grainfather does not ferment the resulting wort.

If you are a brewer who has, or plans to have, a series of vats, kettles, and buckets in your workspace, this product can help you decrease your brewing set-up footprint size, but it doesn't brew the beer for you. You will, however, get the ability to say that you "crafted" your beer, and with the online community set up through The Grainfather, you will be able to say it loudly and clearly to a receptive audience.



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HAZY LITTLE THING CALLED IPA.

BREWIE B20

APPROXIMATE COST: \$2,300

Along the same lines as The Grainfather but with many more bells and whistles, the Brewie B20 is a beautiful, stainless steel countertop device. Newcomers will find it easy to use, and experienced homebrewers will appreciate the ability to customize every aspect of the brewing process with slick online and touchscreen interfaces.

Homebrewers can use the Brewie B20 to create recipes from scratch using their own ingredients, or they can purchase a Brewie Pad, which includes malt, hops, and yeast. After mashing, sparging, and boiling up to 20 liters, the machine even cleans itself. Fermentation takes place in a separate vessel.

"There are homebrewers that don't have the knowledge to get more complicated, and so they can buy our ingredient kits and start brewing there," says Bob Culliton, general manager of Brewie's



North America operations. "After getting some experience, novices can start graduating to creating their own recipes and customizing brewing times. Because of the complete flexibility of creating your own recipes and modifying the beer brewing process, the Brewie also attracts homebrew professionals. We also think

it is applicable for nanobrew and microbreweries for doing test batches, because it's a 5-gallon output, which can scale to larger production."

Brewie Pads start at \$29 and go up to \$190 for a four-pack.

Efraín Villa is a photographer, actor, writer, and global wanderer whose endless quest for randomness has taken him to more than 50 countries in five continents. His writing has appeared on NPR's Weekend Edition, The Good Men Project, TravelWorld International Magazine, Zymurgy, and Spanish-language publications. When not running his consulting firm in Albuquerque, he is busy devouring exotic foods in faraway countries and avoiding adulthood while wearing the least amount of clothing possible. His travel stories dealing with the messiness, humor, and beauty of cultural collisions can be found on his website at aimless-vagabond.com.



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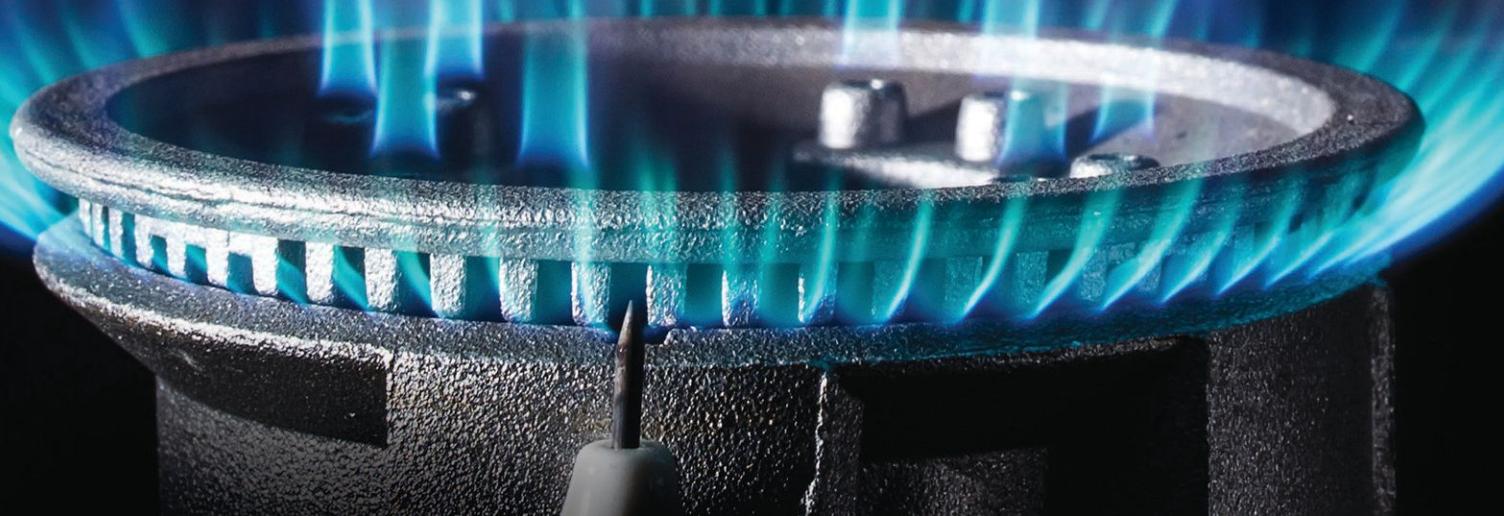
COOKING WITH GAS

CONNECTING PROPANE BURNERS IN SERIES

By Mark Pasquinelli

My wife has an incredible sense of humor. When I finally finished my super strut brew stand, inspired by Drew Beechum and Kent Fletcher (Zymurgy June, 2013), she asked, "**So you're done now, right?**"

I liken my brew stand to the famous Winchester Mystery Mansion in San Jose, Calif. At the insistence of a psychic, Sarah Winchester, heiress to the Winchester gun fortune, built a mansion, paying men to work around the clock. For 38 years they labored, adding random rooms to appease the spirits and atone for the deaths caused by her husband's firearms. To stop building would have meant her death.



Editor's Note: Propane is, of course, a highly flammable gas. Please do not attempt a project like this unless you have experience working with gas and can be confident of your safety.

My brew stand took somewhat less than 38 years to build, and thus far, pauses in its construction haven't incurred my demise. On the contrary, thinking about additions or how I could improve it has kept me mentally sharp and focused on how I can up the ante on my homebrewing game.

Connecting my brew stand's two pumps to switches was the first order of business. Unfortunately, I have zero electrical skills and didn't want to plunge the East Coast into darkness with a rolling short circuit. A friend and fellow homebrewer advised, "Electricity isn't a hobby." In exchange for some homebrews, he wired waterproof switches and outlets into my junction boxes and connected the pumps. Step one was complete.

I wanted my next addition to be more hands-on—redemption for taking a muligan on the wiring. My old brew stand, made from slotted steel angle, had been serviceable and the progenitor of many fine homebrews, but it was also ungainly, with wooden platforms to support propane burners hooked to a separate tank. Wouldn't it be cool, I thought, to connect my burners to a single gas line and draw propane from one tank?

As you may have surmised by now, my mechanical skills are also limited. But I was on a roll, having constructed my new brew stand with minimal problems: cutting through the super strut and connecting the pieces with no loss of appendage. My honor was also at stake. I needed to complete the next project on my own. Like Dr. Frederick Frankenstein in *Young Frankenstein*, guided by his grandfather's

PARTS LIST			
QTY.	DESCRIPTION	UNIT COST	EXT. COST
3	Bayou Classic Propane Burner	\$39.99	\$119.97
3	Brass Gas Ball Valve	\$9.99	\$29.97
3	Gas Pipe - ½" x 11"	\$4.35	\$13.05
2	Gas Pipe Tee - ½"	\$2.29	\$4.58
3	Gas Pipe Nipples - ½" x 1"	\$1.29	\$3.87
1	Gas Pipe Elbow - ½"	\$1.69	\$1.69
2	Pipe Bracket - ½"	\$0.79	\$1.58
1	High Pressure Propane Regulator	\$26.99	\$26.99
1	Yellow Teflon Plumber's Tape	\$3.49	\$3.49
1	Pipe Joint Compound	\$4.98	\$4.98
1	Brass ½" FIP x 3/8" MIP adapter	\$2.98	\$2.98
3	Eaton Weatherhead 90-degree Elbow-3/8" MPT to 3/8" tube OD	\$2.59	\$7.77
3	12" Gasflex ½" OD. With 3/8" FIP x 3/8" FIP adapters	\$10.34	\$31.02
TOTAL			\$251.94

How I Did It book, this is how I did it. And this is how you can do it, too.

THE BIG PICTURE

My wife prides herself on being a "big picture" person. She believes if you keep that in mind, the piddling details resolve themselves. The same philosophy applied to the first step: visualizing the overall gas pipe layout. There are infinite variations to fit every configuration, none more right or wrong than another. My super strut stand has a single tier and is 60 inches (152 cm) long, so one straight gas line suffices. It stretches end to end, with junctions at 1-foot intervals, valves for each burner, and a connection to a high-pressure propane regulator. My next step was to choose a burner.

FIRE POWER

The propane burners are the heart of any

gas-fired brew rig, so choose wisely and with an eye to the future. Perhaps you currently brew only 5-gallon batches and have no plans to do otherwise. Someday, however, someone might ask you to brew 15 gallons of your Mosaic-Galaxy-hopped New England double IPA for a wedding reception. Think not of what is, but dream of what can be.

Although 8-inch Bayou Classic BG10 burners power many propane stands, I found these lacking for my needs. Conversely a low-pressure multi-jet burner might fuse my kettle to the brew stand. Like Goldilocks and her unending quest for everything just right, Bayou Classic's BG14 10" burner was the perfect choice for me.

This high-pressure burner is considered *de rigueur*—the gold standard for many



All three burners lit.



Brew stand with pump heads and chiller removed for clarity.

brew systems, including the venerable Brutus 10. It's an excellent compromise between power and fuel efficiency. One source rated it at 210,000 BTUs, but that seemed high. Then I learned that this was the maximum rating. The BTU output of a burner is actually a function of the regulator. Using an adjustable 10 psi high-pressure regulator, another source's rating of about 70,000 BTUs (with a maximum of 100,000) seemed to be a more plausible number. In the real world, even with the reduction of BTUs, this has proven to be plenty of power, more than enough *oomph* to get more than 15 gallons of wort up to a rolling boil in little time.

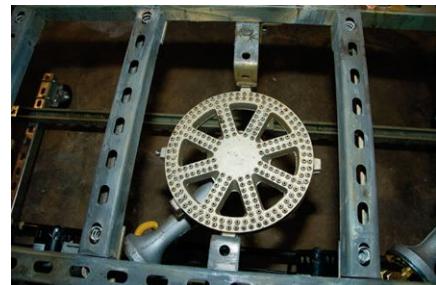
I needed three BG14s, so cost was a major consideration. Prices vary wildly, so shop around. I found mine for \$39.99 each.

PROCURING THE HARDWARE

During my brew stand's inception and construction phase, I used my free time



Exploded view of the gas valve assembly: 1/2" pipe tee, 1" x 1/2" nipple, ball valve, and 3/8" male flare adapter.



Close-up of burner attachment to brew stand

WOULDN'T IT BE COOL, I THOUGHT, TO CONNECT MY BURNERS TO A SINGLE GAS LINE AND DRAW PROPANE FROM ONE TANK?

to view as many rigs as possible, focusing on burner connections and gas hardware. The burners already came with orifice plates and connecting flares. One shop had most of the parts—the gas pipe, ball valves, pipe adapters, nipples, brackets, Tees and elbows, and a high pressure propane regulator. A hardware store had pipe joint compound, Teflon plumber's tape, and a brass connector to attach the propane regulator. I had to

go to a plumbing specialty store for the flexible gas line to connect the pipeline assemblies to the burners. Since assorted connecting hardware—nuts, bolts, and other sundry items—will vary according to your brew stand's construction, I omitted them in the name of brevity.

PUTTING IT TOGETHER

At a total cost of just over \$250, taking into account the price of buying three burners with stands and the convenience factor, the price seemed reasonable. So, armed with the parts in hand and boundless enthusiasm (and a little common sense), I threw myself into connecting everything.

I figured attaching the burners to my brew stand would be the easiest job, so I tackled that first. Banjo Burners are made from cast iron, so they're heavy. I supported mine with a wooden crate while I attached them, but don't be shy about asking for assistance during the mounting phase if you need it.

I had several leftover super strut L-brackets from my stand's construction, and found that suspending the burners from the longer 5" end provided the perfect balance of distance from kettle to burner to regulate heat and allowed more than enough space for air circulation.

The burners didn't come with mounting bolts, and I had a devil of a time finding the right size—until I realized that even though Bayou Classic is located in Louisiana, the burners are made in China. Thus, the bolts are 16 mm metric. I also realized (despite constantly preaching to over-engineer a system) that attaching the burners to only two brackets was more than adequate, since they're not weight bearing.

It took some finagling on my part to properly connect the steel orifice plates, springs, and 3/8" male flares to the burners, trying to get the fit as tight as possible, but still allowing the plate freedom to turn and adjust airflow into the burner.

Next, I connected the black pipe sections to the tees and elbow, assembled the junctures, and connected the flexible gas line. I cranked open the propane tank and opened the regulator. Within seconds, I smelled the sickening aroma of propane gas. I didn't dare attempt to light a burner. Some people use soapy water to check their CO₂ gas lines and such for leaks. I prefer Windex. Contained in a handy spray bottle, it's always ready to go. A few quick spritzes on the joints revealed that my system was leaking everywhere, not just in a few spots. It was back to the drawing board.

PUTTING IT TOGETHER (AGAIN)

For people like me, who occasionally struggle when attempting to install a watertight bulkhead on a brew kettle, making a gas-tight seal was becoming a special challenge. Thus, I thought it might be a good idea to actually know what I was doing on my second attempt. Fortunately, I found an excellent video on gas pipe installation on YouTube.

It turned out I was doing a few things right. The problem was that I hadn't gone far enough. One advantage to doing such



Close-up of valve assembly, 1/2" gas flex, and burner assembly.



Close-up of orifice plate, adapting flare, and brass connecting elbow.



Applying pipe joint compound.



With the pipe elbow cinched in a vise, twist the gas pipe in with a pipe wrench.



Keep the Teflon tape taut and make several clockwise wraps around the pipe.

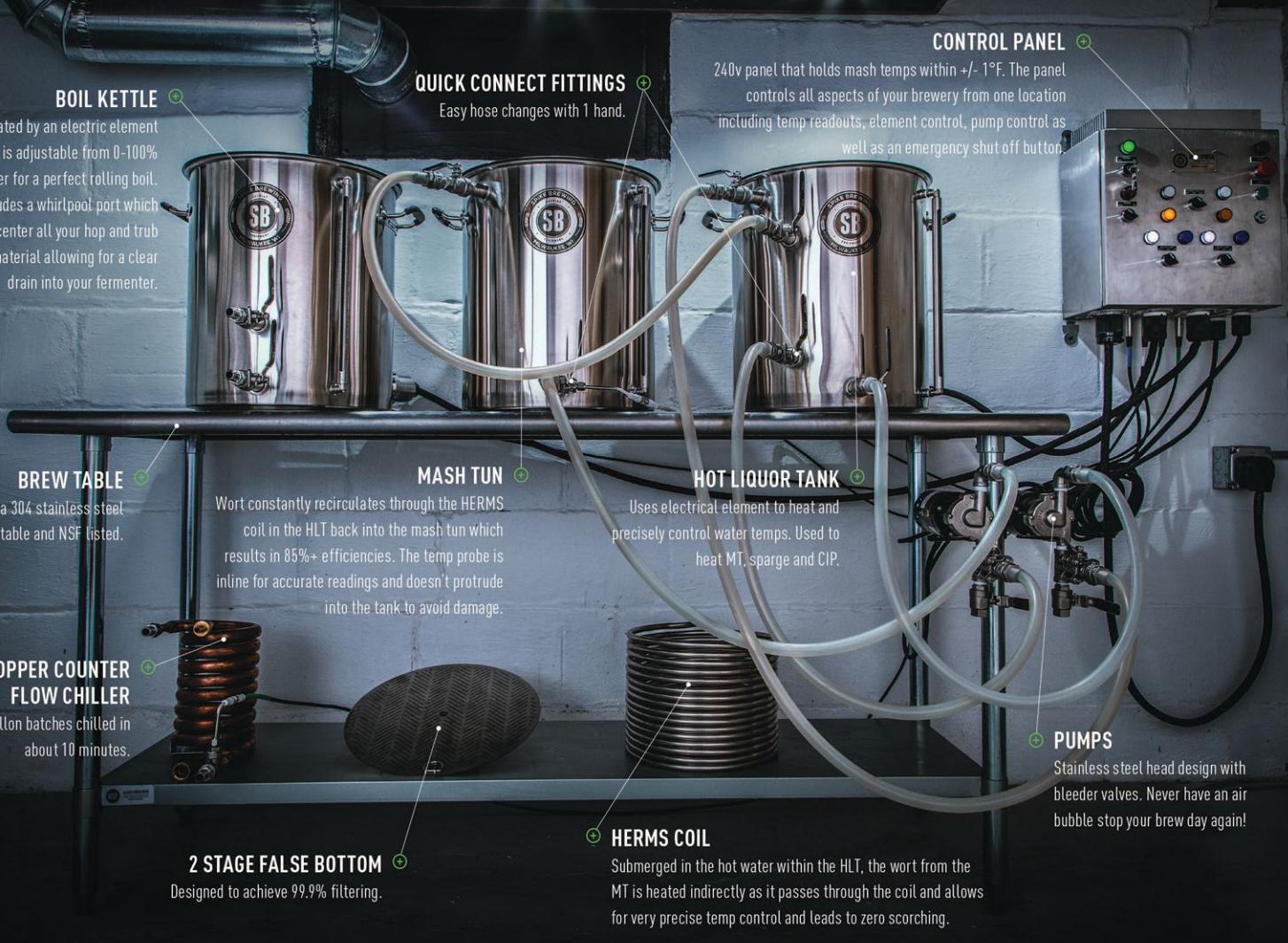
a lousy job the first time was that tearing everything apart (aside from the burners and the orifice plates) and starting anew was easy.

My use of yellow Teflon plumber's tape was one problem. I wasn't using enough. Tape is cheap: don't be stingy. Make several wraps, keeping tension as you go, and press the tape into the threads. In addition, the tape must be wound clockwise for a proper seal. Otherwise, it will unravel into a tangled mess.

I also wasn't using enough pipe joint compound, perhaps due to my obsession for keeping everything neat. I put a liberal amount of joint compound over the tape on the pipe ends the second time and doubled the amount I'd used before.

Last, I wasn't getting enough torque on my first attempt to screw the pipe into the tees and elbow. I purchased a pipe wrench, held the tees and elbow in a vise, and used the wrench to twist the pipe inside. At that moment, I realized how loosely I had originally installed the pipes.

While the pipe line dried, I threaded nipples into each of the three brass ball valves in the same manner, like connecting "Dem Dry Bones." The gas pipe adapters then connected to the other end of the ball valves. I set everything aside to dry until the next day.



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During sparging in the MT, the BK element can be turned on as soon as the element is submerged. By the time your sparge is complete, the BK will nearly be at boil temperatures cutting up to 45 minutes off your brew day.



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MATTERS**

SPIKE SYSTEM SIZES				
10 GALLON	15 GALLON	20 GALLON	30 GALLON	50 GALLON

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TROPICAL HAZE

New England IPA

Recipe by Mark Pasquinelli

One of the first homebrews I made on my brew stand was a New England IPA. I'd been dying to jump headfirst into the style. Tropical Haze IPA has everything you could want: a soft and juicy mouthfeel, smooth hop bitterness, and tons of citrusy and tropical aromas and flavors from late additions of Citra, Mosaic, and Azacca hops.

Batch Size: 6 U.S. gallons (22.7L)

Original Gravity: 1.065 (16° P)

Final Gravity: 1.014 (3.5° P)

Color: 4 SRM

Bitterness: 58 IBU

Alcohol: 6.7% by volume

MALTS AND SUGAR

10 lb.	(4.54 kg) pale malt
1 lb.	(454 g) flaked oats
1 lb.	(454 g) flaked wheat
12 oz.	(340 g) Carapils malt
12 oz.	(340 g) turbinado sugar @ 60 min

HOPS

0.65 oz.	(18 g) Citra 11.9% a.a., first wort hops
0.25 oz.	(7 g) Citra 11.9% a.a. @ flameout (40 min total hop stand)
0.25 oz.	(7 g) Mosaic 13.3% a.a. @ flameout (40 min total hop stand)
0.25 oz.	(7 g) Azacca 12.1% a.a. @ flameout (40 min total hop stand)
0.5 oz.	(14 g) Citra 11.9% a.a. @ 10 min after flameout (30 min total hop stand)
0.5 oz.	(14 g) Mosaic 13.3% a.a. @ 10 min after flameout (30 min total hop stand)
0.5 oz.	(14 g) Azacca 12.1% a.a. @ 10 min after flameout (30 min total hop stand)
0.75 oz.	(21 g) Citra 11.9% a.a. @ 20 min after flameout (20 min total hop stand)
0.75 oz.	(21 g) Mosaic 13.3% a.a. @ 20 min after flameout (20 min total hop stand)

0.75 oz. (21 g) Azacca 12.1% a.a. @ 20 min after

flameout (20 min total hop stand)

1 oz. (28 g) Citra 11.9% a.a., first dry hop 5 days

1 oz. (28 g) Mosaic 13.3% a.a., first dry hop, 5 days

1 oz. (28 g) Azacca 12.1% a.a., first dry hop, 5 days

1 oz. (28 g) Citra 11.9% a.a. second dry hop, 5 days

1 oz. (28 g) Mosaic 13.3% a.a., second dry hop, 5 days

1 oz. (28 g) Azacca 12.1% a.a., second dry hop, 5 days

YEAST

Wyeast 1318 English Ale III (1.5 L starter)

WATER

Cl 150 ppm, SO₄ 75 ppm, Ca 125 ppm

ADDITIONAL ITEMS

Wyeast yeast nutrient @ 10 minutes

DIRECTIONS

Mash at 150° F (66° C) until conversion is complete. Lauter and sparge to collect 7.5 gal. (28.5 L) of wort and boil 60 minutes. Do not add Whirlfloc or Irish moss. At flameout, wait until wort cools to 180° F (82° C) to avoid volatizing hop oils. Set timer for 40 minutes and add first hop stand addition. After 10 minutes and 20 minutes, respectively, add the second and third hop stand additions. After the total hop stand of 40 minutes, chill wort to 67° F (19° C), decant starter, pitch yeast, and aerate. Over the course of the two-week fermentation, ramp the temperature up to 73° F (23° C) to ensure full attenuation. On approximately day five of fermentation, when attenuation has reached about 80 percent, add the first dry hop addition. (Optionally, you could add a can of thawed pineapple or grapefruit juice concentrate at this point.) Five days later, remove the first dry hop addition, add the second addition, and dry hop for five more days. Carbonate to 2.5 volumes (5 g/L) of CO₂ (or add 3.75 oz./106 g corn sugar if bottling) and drink fresh. *Prost!*

EXTRACT VERSION

Steep Carapils for 30 minutes at 155° F (68° C) and substitute 5 lb. (2.27 kg) extra light dried malt extract and 3 lb. (1.36 kg) wheat dried malt extract for the pale malt, flaked oats, and flaked wheat. Then proceed as above.

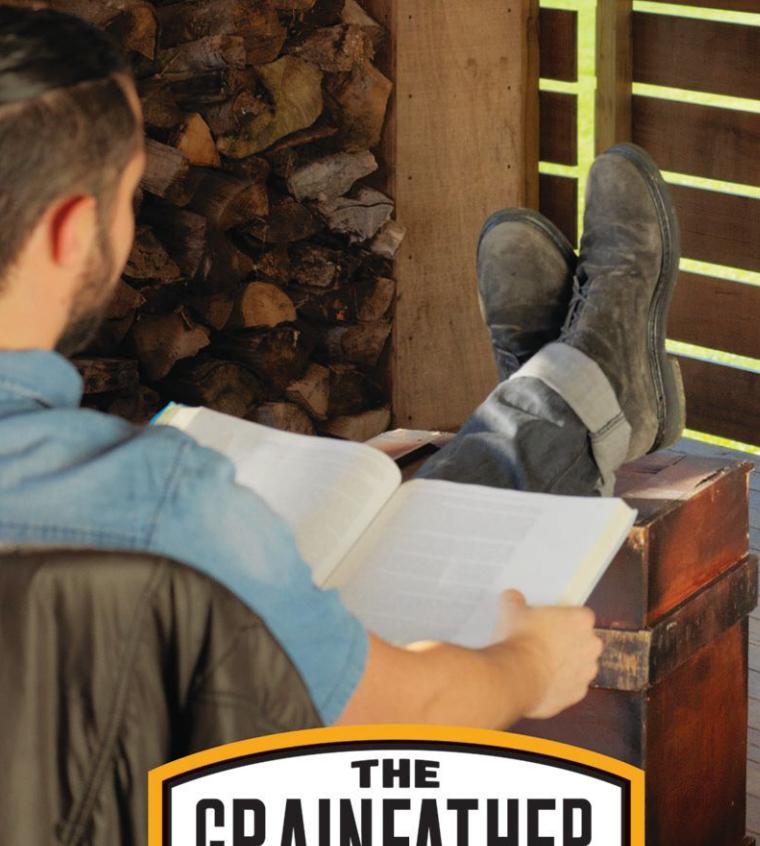
I twisted the gas valve assemblies into the elbow and tees on the gas pipe stem, making sure all three valves were aligned, facing outward. Next, I attached the completed lower pipe assembly to the inside front of my brew stand using the brackets and some assorted bolts, nuts, and washers. I waited until the joint compound had dried completely before I connected the flexible gas line

(using copious amounts of Teflon tape) to the adapters below and the brass elbows above. It was tight work, but my placement of the brew stand's front supports afforded me just enough space.

With bated breath, I opened the regulator to hear a *whistling* and *whooshing* sound...then I took a deep breath—no odor of propane!

I sprayed the pipe junctures with Windex just to be sure. Nothing. I opened one of the brass ball valves until I heard the *hiss* of gas and touched a lighter to the burner. A flash of blue and yellow light dissipated into beautiful array of colored flames. A quick adjustment of the burner's orifice plate brought everything to a nearly pure blue. I repeated the operation on the second burner.

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When I lit the third burner, it jumped to life instantly, but I sighed when a few of the outlets didn't ignite. Seconds later, my despair turned to joy when the entire burner glowed bright blue. Success! Now I was indeed cooking with gas!

EPILOGUE

It's been over a year now, and the burners and brew stand have served me well, cranking out many fine batches of homebrew. The Beechum-Fletcher-inspired stand is solid as a rock, with

only some cosmetic blemishes that I view as scars of honor. The Bayou Classic burners have acquired a rich patina and have had virtually no maintenance or adjustment issues. They heat my hot liquor tank, bring a mash to the right temperature, and reach a rolling boil in almost no time.

What's next for my brew stand? That's a good question. Unlike Sarah Winchester, I'm fairly certain I won't perish if I call it quits on construction. However, I like to keep my wife guessing, and sometimes it's better to be safe than sorry. Perhaps a future RIMS (recirculating infusion mash system) tube addition to the mash tun might keep me in good standing with the homebrewing gods.

Mark Pasquinelli resides in the bucolic town of Elysburg, Pa., where he spends his time in varying degrees as a husband, writer, homebrewer, microbiologist, and manservant for five felines.

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*...it was cloudy and
came in a big, curvy
glass...it smelled like
bananas and tasted
unlike any other beer
I had ever tasted...*



THE MANY WAYS TO Weissbier

By Chris Colby

I remember my first German wheat beer (weissbier). It was cloudy and came in a big, curvy glass that the bartender had garnished with a slice of lemon. It smelled like bananas and tasted unlike any other beer I had ever tasted. I didn't know what to think.

Now I'm a big fan of weissbier. It's a great beer style that can teach a brewer a lot about brewing. Typically brewed with two types of malt, a single hop addition, and a characterful ale yeast, it's possible to view weissbier as simple. On the other hand, when the brewer understands how variations in mash program, fermentation temperature, pitching rate, and other variables influence the final beer, it's clear that much complexity lies just beneath the surface.

Get Wise to the Weisse

Weissbier is an ale made from a mix of wheat malt and barley malt, most often red wheat malt and Pilsner malt. Hefeweizen is a pale weissbier that is hazy and has yeast sediment in the bottom of the bottle. That turbidity comes from high levels of protein in the wheat malt and the production method, especially the absence of fining or filtration. This may be augmented by pouring some or all of the yeast in the bottle into the glass when served.

Weissbiers are fermented with an ale strain that produces more esters and phenols than a typical ale strain. The most prominent ester produced by weissbier strains gives the beer a banana aroma, and the most prominent phenol lends a character most frequent-

ly described as clove. Some weissbier strains additionally lend bubblegum or other estery characters.



To learn more about the chemistry of weissbier flavors and aromas, check out HomebrewersAssociation.org/weissbierchemistry

Weissbiers are highly carbonated and support a large foam stand. The high carbonation contributes to a dry, refreshing finish. Everything in weissbier—from the level and stability of the haze, to the balance of banana and clove, to the volume and character of the foam—can be manipulated by the brewer if they know what they are doing.

You can make a good weissbier on your first try. You can also spend the rest of your homebrewing life trying to make the perfect weissbier with the exact characters you desire. You can make a great wheat beer following “the usual” way homebrewers brew an ale, or you can opt for a method that more closely mimics historic commercial production. It's all up to you.

Grist and Wort Production

Weissbier grist is 50 to 70 percent wheat malt, with the remainder a pale barley malt, usually Pilsner. The target original gravity (OG) is 11–13° P (SG 1.044–1.052) with a color of 2–6 SRM. Wheat malt extracts often are made from a 50/50 blend of wheat and barley malts, although other ratios are available.

The absolute simplest way to produce wheat beer wort is to dissolve some

wheat malt extract in water, but a better approach is to perform a partial mash. The wort from a small mash augments the extract wort, dries it out a little, lightens the color of the beer, and—most importantly—adds fresh malt character that gets lost during malt extract production. The recipe Left on Colden Hefeweizen (accompanying this article) and Right on Hoover Hefeweizen (at HomebrewersAssociation.org/rightonhoover) are two beers made with this approach.

The simplest approach to making all-grain wheat beer wort is to perform a single infusion mash. Modern, fully modified malts are ideal for the single infusion mash, so this is not cutting corners. A more complex mash is not required unless the brewer wishes to emphasize the phenolic (clove) aspect of the beer. Weissbiers have a fairly dry finish, but you needn't necessarily mash for high fermentability to achieve this.

A single infusion mash in the 148–150° F (64–66° C) range, at a normal to slightly thin mash thickness, for 60 to 90 minutes, is all that is required. Some homebrewers add rice hulls to aid lautering, but if you mash out and don't run the wort off too quickly, this usually isn't necessary. When making a single infusion mash weissbier, it's best to keep the percentage of wheat closer to 50 than 70 percent. See the Holier than Meow Hefeweizen recipe for a simple, single infusion mashed weissbier.

If you prefer a pronounced clove character, performing a step mash with a ferulic acid rest can help. Resting at 111–113° F

(44–45° C) for 10 minutes releases ferulic acid from the malts, which yeast later converts to 4-vinyl-guaiaacol, or clove aroma. To really bring out this character, the brewer needs to suppress ester production in fermentation. A rest in this range may also degrade some of the beta glucans in the wheat malt and make lautering easier. The pH optimum for this rest is 5.7—higher than what is best for the mash overall. However, there is still activity at lower pH levels, so you do not need to adjust your mash pH for this single rest.

The remainder of the mash should take place in the mid saccharification range—150–153° F (66–67° C) for 50 to 75 minutes to complete starch conversion. With fully modified malts, a long rest in the traditional “protein rest” range—113–131° F (45–55° C)—may impede foam production.

A single infusion mash or a simple step mash will work, but it isn’t traditional. For early to mid 20th century authenticity, you should employ a single decoction mash with under-modified Pilsner malt as the barley malt. One way to do this is to mash in at 95–104° F (35–40° C) at 1.45–1.68 qt./lb. (3.0–3.5 L/kg) and then heat the entire mash slowly—around 2° F (1° C) every minute—to somewhere in the 122–131° F (50–55° C) range. This will take you past the ferulic acid rest, and you can rest there, at 111–113° F (44–45° C), for a few minutes if you’d like. Rest for about 20 minutes if your rest temperature is 122° F (50° C) or 15 minutes if it is 131° F (55° C), then pull the decoction.

The decoction should be roughly 33 to 40 percent of the mash volume and taken from the thickest portion of the mash. Heat the decoction to 158–162° F

(70–72° C) and hold roughly 15 minutes, or until an iodine test comes back negative. Then, boil the decoction for 20 to 40 minutes. Heat the decoction as gently as possible to avoid scorching, and stir continuously. At a homebrew scale, you may also need to add water to the decoction as it boils to avoid scorching. This isn’t authentic, but neither is a scorched decoction. While the decoction boils, the main mash should be maintained at around 122° F (50° C). If your mash tun cannot be heated, mash in your kettle and boil the decoction in a smaller vessel.

Return the decoction to the main mash to bring the temperature to around 149° F (65° C). Hold there for around 15 minutes, and heat the combined mash to 158–162° F (70–72° C) to finish starch conversion. This should not take long. Perform an iodine test every 5 minutes

LEFT ON COLDEN *Hefeweizen*

This is a very straightforward extract recipe with 50 percent wheat malt. A small partial mash lends the aroma of wheat and Pilsner malts.

Batch Size: 5 US gallons (18.9 L)

Original Gravity: 1.046 (11.4° P)

Final Gravity: 1.011 (2.6° P)

Bitterness: 19 IBU

Color: 3.6 SRM

Alcohol: 4.4% by volume

Malts

- 4 lb.** (1.8 kg) liquid wheat malt extract
- 1.5 lb.** (680 g) Pilsner malt
- 1.5 lb.** (680 g) red wheat malt

Hops

- 1.25 oz.** (35 g) Hallertau, 4% a.a. @ 60 min

Yeast

- 11 g sachet** Danstar Munich Wheat Beer dried yeast
(no starter required)

Additional Items

- 6.5–9.5 oz.** (180–270 g) corn sugar for priming

Brewing Notes

In a large kitchen pot (not your brew kettle), heat 1 gallon (4 L) of water to 161° F (72° C). Place crushed malts in a nylon steeping bag and steep them in the hot water for 45 minutes, holding the temperature as close to 150° F (66° C) as you can. (This is a small mash.) Stir occasionally. Heat 0.5 gallons (2 L) of water to 170° F

(77° C) in another small pot and heat 2.5 gallons (9.5 L) of water to a boil in your brew pot.

When the mash is over, suspend the grain bag in a colander over your brew kettle. Pour the wort from the small mash through the grains (to filter out any large bits of grain) and rinse with the 170° F (77° C) water. Set grain bag aside. Dissolve roughly half the malt extract in the brew pot and resume boiling. To dissolve the malt extract, put it into one of the pots you used previously. Ladle hot wort from the brewpot onto it and stir to “pre-dissolve” it a bit. Then, stir it into the brewpot liquid. This will help ensure that none of the heavy extract sinks to the bottom of the pot and scorches.

Boil for 60 minutes, adding hops at the beginning of the boil. Do not let boil volume dip below 2.5 gallons (9.5 L) during boil. Top up with boiling water, if needed, to avoid this. Stir in the remaining malt extract during the final 10 minutes of the boil. When the boil is finished, cool the wort to 54° F (12° C), or as cool as you can get it with a reasonable effort. Transfer to a sanitized fermenter and top up to 5 gallons (19 L) with cool water.

Aerate the wort and pitch the yeast. Ferment, allowing the temperature to creep up to 64° F (18° C). Prime beer with corn sugar in bottling bucket. If using standard beer bottles, prime for 3 volumes (6 g/L) of CO₂ using 6.5 oz. (180 g) of corn sugar. If you are using heavy wheat beer bottles, prime for 4 volumes (8 g/L) of CO₂ using 9.5 oz. (270 g) of corn sugar. Store bottles somewhere warm for two weeks. Check for carbonation and move beer to cold storage.

until you get a negative result. Then, heat the mash to 168° F (76° C) for mash out. After five minutes or so, transfer the mash to the lauter tun (if needed).

Collect wort as you normally would, keeping in mind that weissbier wort is more viscous than all-barley wort. Keep the runoff slow and the grain bed near 168° F (76° C) to make lautering easier. If you foresee problem, add rice hulls to the mash (presoak rice hulls in warm water to minimize absorption in the mash), perform a beta glucanase rest at 113–122° F (45–50° C), or both. A stuck mash can usually be recovered by underletting with hot (168° F/76° C) water.

Throughout the mash and during lautering, shielding the mash and wort from oxygen will minimize color pickup and produce a beer that is less primed for staling. Conditioning the malt, mashing in gently (perhaps via underletting), stirring the mash and decoction quietly, and employing a mash cap can all help in this regard.

Hops and the Boil

Weissbier wort is similar to most ale wort, except the concentration of proteins is higher. As such, extending the boil time beyond the usual will result in better break formation. For all-grain weissbier

worts, 90–120 minutes is a good goal. Extract brewers should shoot for 60–75 minutes. In either case, you may need to add water during the boil if the volume dips too low.

Weissbiers aren't very bitter. With the exception of some newer, hoppy wheat beers, bitterness is usually below 18 IBU. The hop chosen is almost always a noble variety, again with the exception of the "hop weizens." Given the extra protein in weissbier wort, choosing a low-alpha-acid variety will require more hops to hit the target IBUs and add more tannins to the wort, which improves hot break formation.

Yeast and Fermentation

Weissbier is fermented with a yeast strain that produces distinct banana and clove aromas. Many wheat beer strains are available to homebrewers in liquid and dried forms. Each has its own characteristics, and these characteristics can be manipulated via fermentation temperature, pitch rate, and whether the fermentation is conducted in a closed or open fermenter. Homebrewers serious about developing their own house weissbier would be wise to do some split-batch experiments to find a strain that gives them the results they like.

If you've never brewed a German wheat before, Wyeast 3068 Weihenstephan

Weizen and White Labs WLP300 Hefeweizen Ale give the "classic" weissbier profile. Weissbier typically finishes at a final gravity (FG) of 2.5–3.5° P (SG 1.010–1.014), for an alcohol content of 4.3–5.6% alcohol by volume (ABV).

In *German Wheat Beer*, Eric Warner says a rule of thumb for weissbier is that the sum of the pitching temperature and fermentation temperature (in Celsius) should equal thirty. In particular, he says pitching at 12° C (54° F) and fermenting at 18° C (64° F) is common. This should yield a beer with a balance of banana and clove. Fermenting at higher temperatures will increase both the banana and clove characters, but the banana will increasingly mask the clove.



Learn more about weissbier with the Brewers Publications *German Wheat Beer* by Eric Warner. BrewersPublications.com



The typical pitching rate is around 1 million cells per milliliter per degree Plato of original gravity (cells/mL/°P), with 1.25 million cells/mL/°P being near the top end of the range. Higher pitching rates result in lower ester and clove levels. Lower rates yield an increasingly banana-y weissbier. The fermentation temperature and pitching rate both influ-

HOLIER THAN MEOW *Hefeweizen*

A straightforward, single-infusion-mash wheat beer made from 50 percent wheat malt. The procedures aren't traditional, but nobody will know that unless you tell them.

Batch Size:	5 US gallons (18.9 L)
Original Gravity:	1.048 (11.9° P)
Final Gravity:	1.010 (2.6° P)
Bitterness:	18 IBU
Color:	3.5 SRM
Alcohol:	4.9% by volume

Malts

4.5 lb.	(2 kg) Pilsner malt
4.5 lb.	(2 kg) red wheat malt

Hops

1.2 oz.	(34 g) Hallertau, 4% a.a. @ 60 min
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Yeast

Wyeast 3068

Weihenstephan Weizen or White Labs WLP300 Hefeweizen Ale Yeast (1.3 qt. or 1.2 L starter)

Additional Items

9.5 oz.

(270 g) corn sugar for priming to 4 vol. (8 g/L) CO₂

Brewing Notes

Prepare yeast starter 2–3 days ahead of time. Mash at 149° F (65° C) for 60–75 minutes with 3 gal. (11.4 L) of water. Mash out at 168° F (76° C), recirculate, and collect 5.9 gallons (22 L) of wort. Boil 60–75 minutes, adding hops with 60 minutes left. Chill wort to 54° F (12° C), aerate, and pitch yeast. Ferment and allow temperature to rise to 64° F (18° C). After fermentation, let beer sit 3–7 days. Add priming sugar and bottle in heavy bottles.

Table 1: Priming for 5 Gallons (19 L) of Weissbier

Priming agent	Volumes of carbon dioxide (CO ₂)		
	3	4	5
Corn sugar	6.25 oz. (180 g)	9.25 oz. (260 g)	12.25 oz. (350 g)
Speise from cast wort with OG 1.050 & FG 1.011	2.4 qt. (2.3 L)	3.7 qt. (3.5 L)	5.2 qt. (4.9 L)
High-gravity speise of OG 1.064 & FG 1.014	1.8 qt. (1.7 L)	2.8 qt. (2.7 L)	3.8 qt. (3.6 L)
Dried malt extract	11.5 oz. (330 g)	1 lb. 2.4 oz. (520 g)	1 lb. 10 oz. (740 g)

Priming material for 5 gallons (19 L) of weissbier at 3, 4, and 5 volumes of CO₂.

ence the beer's yeast character, so take care to note both each time you brew a weissbier if you want make effective tweaks later.

Traditionally, weissbiers were fermented in square, relatively shallow, open vessels, and many commercial hefeweizens

are still produced that way. Open fermentation not only alters the character of the beer, but allows the brewer to crop yeast from the beer at high kräusen (the peak of fermentation).

Of course, the overwhelming majority of fermentations carried out by homebrew-

ers take place in a closed fermenter. The obvious concern with attempting open fermentation at home is sanitation. One way to mimic some aspects of open fermentation is to aerate the wort, pitch the yeast, and begin the fermentation in a sealed bucket. Once the top of the wort is covered with foam, open the bucket until fermentation begins to slow. Then, before the kräusen falls, replace the bucket lid and airlock.

Packaging

Weissbiers are highly carbonated and traditionally packaged in bottles. Serving wheat beer from a keg can be difficult because high carbonation can mean rebalancing your draft system. Most German wheat beers imported into the US come in heavy 1.1 pint (500 mL) bottles. Homebrewers should use these heavy bottles when prim-

KEVIN'S Mom

A full-on, German-style wheat beer with 69 percent wheat malt brewed with a single decoction mash and open fermented (OK, semi-open). Take good notes when you brew this—they will allow you to begin tweaking the beer to your idea of weissbier perfection.

Batch Size: 5 US gallons (18.9 L)

Original Gravity: 1.052 (12.8° P)

Final Gravity: 1.012 (3.1° P)

Bitterness: 19 IBU

Color: 3.9 SRM

Alcohol: 5.1% by volume

Malts

6.75 lb. (3.1 kg) red wheat malt

3 lb. (1.4 kg) undermodified Pilsner malt

Hops

1.3 oz. (35 g) Hallertau, 4% a.a. @ 60 min

Yeast

Wyeast 3068 Weihenstephan Weizen or White Labs WLP300 Hefeweizen Ale yeast (1.2 qt. or 1.1 L starter)

Additional Items

3.6 qt. (3.4 L) speise (at SG 1.052) to prime for 4 vol. (8 g/L) CO₂

1.2 fl. oz. (34 mL) lager yeast

Brewing Notes

Prepare yeast starter 2–3 days ahead of time. Mash grain with 4.1 gallons (16 L) of water at 104° F (40° C). Immediately start heating the mash to 122° F (50° C, stirring continuously but gently. Rest mash for 5 minutes at 113° F (45° C, heat to 122° F (50° C), and

rest 15 minutes.

Pull a thick decoction of about 40 percent of the mash volume. Transfer to a large pot and heat, stirring gently and continuously. When the decoction reaches 158° F (70° C), rest until an iodine test comes back negative, and continue heating. Boil decoction 20 minutes while maintaining the main mash at 122° F (50° C).

Return the decoction to the main mash with as little splashing as possible. Stir and adjust temperature, if needed, to 149° F (65° C). Hold at 149° F (65° C) for 15 minutes, heat mash to 158° F (70° C), and rest until a negative iodine test is returned. Heat mash to 168° F (76° C), recirculate wort for 20 minutes, and begin runoff. Sparge at 168° F (76° C) and collect 6.3 gallons (24 L) of wort.

Boil 90 minutes, adding the hops for the final 60 minutes. Cool the wort to 54° F (12° C). Transfer 3.6 qt. (3.4 L) of this (chilled, not aerated, not pitched) wort to sanitized Mason jars. Store jars in a refrigerator until needed (as speise). Transfer the remaining wort to a sanitized bucket fermenter, aerate the wort, and pitch the sediment from the yeast starter.

Ferment and allow temperature to rise to 64° F (18° C). Remove lid for the 1 to 2 days of most vigorous fermentation. Resume closed fermentation after this period. After fermentation, allow beer to settle for 4–10 days. Prime with speise, add lager yeast, and bottle in heavy bottles. Store the beer warm for 2 weeks to bottle condition.

ing their weissbiers for high levels of carbonation. Take care when packaging in thinner bottles that may not support such high carbonation!

The easiest way to package a weissbier is to prime the bottles with corn sugar. However, you can also try the more traditional methods of priming with speise or priming with kräusen beer.

Speise (“gyle” in English) is wort added to a beer to carbonate it. It works in the same way priming sugar does—feeding the yeast, fueling a secondary fermentation, and trapping the carbon dioxide (CO_2) in the bottle. At home, a brewer can save and boil some of his or her first wort—the high gravity wort run off before sparging—boil it briefly for sanitation and refrigerate it for use as speise. Or, you can save some cast wort—wort that has been boiled in the kettle, but not yet aerated and pitched with yeast—in the same manner. Alternatively, you can prepare speise as needed, which can be as simple as boiling and cooling some wheat malt extract.

The volume of speise used to prime 5 gallons (19 L) of beer depends on the residual level of CO_2 in the green weissbier, the density of the wort, and the intended level of carbonation. Pale weissbiers can be carbonated anywhere in the range of 3 to 5 volumes (6 to 10 g/L) of CO_2 . See Table 1 for the appropriate levels of sugar or speise to add to your beer.

If you add lager yeast for bottle conditioning, add 0.8–1.8 fl. oz. (24–52 mL) of thick lager yeast slurry per each 5 gallons (19 L) along with the speise. Kräusening—adding fermenting beer to a green beer for conditioning and carbonation—is also a traditional practice, but that's a whole article in itself.

The Dry Finish

There are many ways to make a pale weissbier. If you're brewing it as a one-shot thing, following your usual brewing methods—whether extract or all-grain—can produce a fine beer. If you want to take a more traditional approach, you can emulate much of the traditional process at home. If you plan

to brew a wheat beer repeatedly, exploring the yeast strains, mash programs, fermentation methods, and packaging options will give you more control over the final product. If you do this, be sure to take extensive notes each time you brew. Record every detail, and make tasting notes for each beer. Taste each beer next to commercial examples you enjoy. There are many ways to brew a great German wheat beer. I hope you find yours.

Chris Colby has been a homebrewer since the early 90s, when he studied molecular evolutionary genetics at Boston University. After receiving his PhD in 1997, he briefly worked in educational publishing before becoming a beer writer and editor. He is the author of *Home Brew Recipe Bible* and is currently editor of *Beer and Wine Journal* (beerandwinejournal.com). He lives in Bastrop, Texas, with his wife and many cats.

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By Amahl Turczyn

2^a Copa Sudamericana de Homebrewers

The Association of Chilean Homebrewers celebrated the second South American Homebrewers Cup in Santiago de Chile July 20–22, 2017. The South American Homebrewers Cup is a rotating competition that draws entries from several countries in South America, and the Chilebruers Homebrew Club were proud to host this year's event. The inaugural event was held in 2014, in Montevideo, Uruguay, and was organized by the Argentina and Uruguay Homebrew Associations. At this time, there is no word on the following event's host country; Argentina and Brazil are both strong candidates, but a firm decision hasn't been made quite yet.

The 2017 event was a resounding success. Organizer and club member Roberto Hidalgo explained, "For our club, hosting this event was incredibly positive, and given that we only had six months to plan for it, what our members accomplished exceeded all expectations. The competition drew 82 entries from five South American countries, headed by Chile with 35; Argentina with 19; Uruguay, with 10; and finally Brazil and Peru with nine. Judging was held on the Mayor University campus, backed by 18 judges from each of these five countries, plus one American judge. Among all the judges gathered, there were representatives from homebrew clubs in Brazil (Acerva Brazil), Peru (Association of Homemade Brewers of Peru: ACECAS), Uruguay (Club De Cerveceros Caseros Uruguay), and Argentina (Somos Cerveceros)."

Hidalgo also wanted to extend a special thanks to all the judges who participated: Igor Puorro from Brazil; Silvia de Tomas from Peru; Fernando Aguiar, Jose Bini, and Hector Leal from Argentina; Lucio Faina and Daniel Rocamora from



Juan Santos and Tomás José Avalos.

Uruguay; Denny Conn from the USA; and Gabriel Lara, Christoph Fluskamp, Gonzalo Gonzalez, Leonardo Caiafa, Jaime Ojeda, Fabian Lara, Juan Cabrera, Cristian Orellana, Gonzalo Castillo and Claudio Miranda from Chile."

After winners were announced, the competition awarded 12 bronze, 12 silver, and 7 gold medals. Two best-of-show awards were given. The overall contest winner, the Best Brewer award, went to Argentinean brewing duo Juan Manuel Santos and Tomás José Avalos, who were awarded an Evolution counter-pressure bottle filler with their BeerCase, made by Pegas Draft Systems. The second runner-up best-of-show, the Best Beer prize, was awarded to Brazilian Rodrigo Campos Oliveira and his fruit beer, a Berliner



AMERICAN IPA CON POMELO ROSADO (PINK GRAPEFRUIT AMERICAN IPA)

Overall Best of Show: Best Brewer

2^a Copa Sudamericana de Homebrewers 2017, Chile

Juan Manuel Santos and Tomás José Avalos

Batch Size: 20 Liters (5.3 gal.)

Original Gravity: 1.062 (15.3° P)

Final Gravity: 1.010 (2.5° P)

Bitterness: 42 IBU

Color: 5 SRM

Alcohol: 7% by volume

Total Efficiency: 80%

MALTS

2.5 kg (5.5 lb.) Pilsner malt

2 kg (4.4 lb.) pale ale malt

HOPS

4.8 g (0.17 oz.) Zeus, 13.3% a.a. @ 60 min

26 g (0.92 oz.) Simcoe, 15% a.a., 60 min hop stand

5 g (0.18 oz.) Bravo, 15% a.a., 60 min hop stand

30 g (1.06 oz.) Zeus, dry hop 3 days

20 g (0.7 oz.) Cascade, dry hop 3 days

20 g (0.7 oz.) Simcoe, dry hop 3 days

15 g (0.5 oz.) Bravo, dry hop 3 days

15 g (0.5 oz.) Calypso, dry hop 3 days

YEAST

American ale yeast

ADDITIONAL INGREDIENTS

0.2 g Servomyces @ 5 min

350 g (12.4 oz.) grapefruit pulp per 9.8 L (2.6 gal)

BREWING NOTES

Mash in at a rate of 3 liters water per kilogram of grain (1.4 qt./lb.) at 66° C (150° F) for 90 minutes and adjust pH to 5.3 if necessary. Mash out at 75° C (167° F) for 10 minutes. Sparge at 70° C (158° F), maintaining a pH of 3.5 to 4.5. Boil 90 minutes. Pitch yeast at 19° C (66° F) and ferment at 19–20° C (66–68° F) for the first few days. When the beer reaches 1.025 (6.23° P), increase fermentation temperature to 21–23° C (70–74° F), the optimum temperature range for dry hopping.

Prepare fruit by removing the peel and seeds and freezing the pulp. Then pasteurize pulp by covering it with water in a pot and bringing the water temperature up to 70–75° C (158–166° C) for 15 to 20 minutes. When the beer has attenuated to 1.017 (4.8° P), add dry hops and pasteurized, cooled grapefruit pulp. Hold at dry-hopping temperature range for 3 days. Cold crash to 0° C (32° F) and hold for 2 weeks to clarify.

EXTRACT VERSION

Substitute 4.75 lb. (2.15kg) of Pilsner malt extract syrup for the Pilsner malt and 3.75 lb. (1.7 kg) pale malt extract syrup for the pale ale malt. Add 8 oz. (227 g) dextrose. Dissolve extracts and sugar in reverse osmosis or distilled water to desired boil volume and proceed as above.

weisse with dragon fruit and guava. As part of the award, Oliveira will brew a 500-liter batch of his recipe at Yakima Brewery in Santiago de Chile.

"The competition was accompanied by a full day of conferences and camaraderie focusing on homebrewers," continued Hidalgo. "We had six booth exhibitors, four lecturers,

and a discussion forum on brewing news. The commemorative beer was a saison with blueberries and raspberries." Everything ended with the award celebration, which was held at Cervecería Spoh. "We poured some excellent homebrew for the 80 to 90 people who attended the reception, which included live music and drums."

Hidalgo was effusive with thanks to participants. "As part of the Chilebruers homebrew club, we would like to thank all the volunteers who helped with this event, and our sponsors, Copa Cervezas de America, who thought us worthy enough to offer us the challenge."

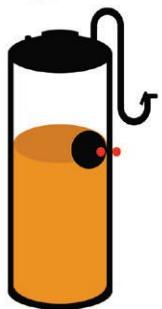
"We'd also like to thank Mayor University and the Manuel Montt Headquarters for

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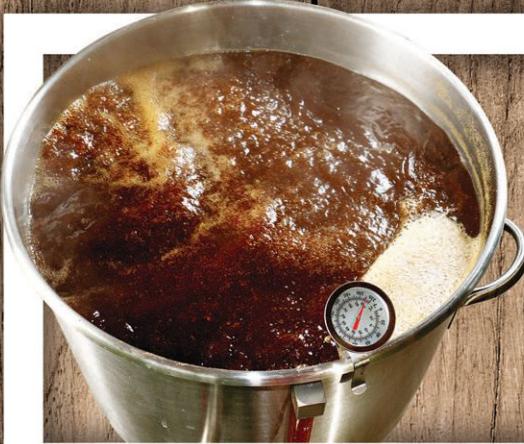
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PSYCHEDELIC WEISSE (BERLINER WEISSE WITH DRAGON FRUIT AND GUAVA)

Second Best of Show: Best Beer

2^a Copa Sudamericana de Homebrewers 2017, Chile
Brewer: Rodrigo Campos Oliveira (Fortaleza, Brazil)

Batch Size: 20 liters (5.5 US gal.)

Original Gravity: 1.032 (8° P) before fruit addition

Final Gravity: 1.008 (2° P)

Bitterness: 3 IBU

Color: 2.5 SRM

Alcohol: 3.1% by volume

Mash Efficiency: 70%

MALTS

1.6 kg (3.5 lb.) Continental Pilsner malt

1.6 kg (3.5 lb.) wheat malt

HOPS

12 g (0.4 oz) Hallertauer Mittelfrüh, 4% a.a.

@ 15 min

BACTERIA AND YEAST

Lactobacillus (plantarum or brevis)

American or German ale yeast

EXTRA INGREDIENTS

1.2 kg (2.65 lb.) guava (secondary)

1.2 kg (2.65 lb.) dragon fruit (secondary)

BREWING NOTES

Make 0.5 to 1 quart (0.5 to 1 L) Lacto starter 24 hours before mash-in. Mash grains with 10 liters (10.6 qt.) of water. Hold at 55° C (131° F) for 10 minutes, 66° C (150° F) for 60 minutes, and mash out at 78° C (172° F) for 10 minutes. Sparge with 16 liters (16.9 qt.) of water at 78° C (172° F). Cool wort to 36° C (97° F) and pitch the Lacto starter. Let it sour for 24 to 36 hours (kettle souring).

Boil for 15 minutes, adding the hops according to recipe. Cool the wort, pitch yeast starter at 18° C (64° F) and ferment at 19° C (66° F). When attenuation is 66 to 75 percent finished, add pasteurized fruit as puree or juice and increase fermentation temperature to 23° C (74° F). Continue fermentation until it reaches a stable final gravity. Cold crash to 0° C (32° F) and hold for at least 1 week for clarification, then prime or keg to 3.5 vol. (7 g/L) of CO₂.

EXTRACT VERSION

Substitute 5 lb. (2.27 kg) of wheat malt extract syrup for the wheat and Pilsner malts. Dissolve extracts in reverse osmosis or distilled water to desired boil volume and proceed as above.

The advertisement features a central image of the book "How to Brew" by John J. Palmer. The book cover shows a glass of beer with hops and grain in the foreground. To the left, there's a tall glass filled with beer and a wooden spoon resting on a counter. In the background, several bottles are visible. On the right side, there's a large orange speech bubble containing the text "FULLY REVISED & UPDATED" and "BrewersPublications.com". Below this, another orange circle contains the text "ORDER NOW". The Brewers Publications logo is in the bottom left corner, and the Homebrewers Association logo is in the bottom right corner.

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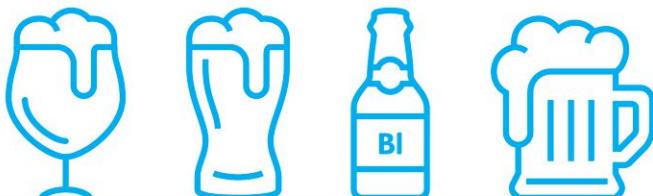
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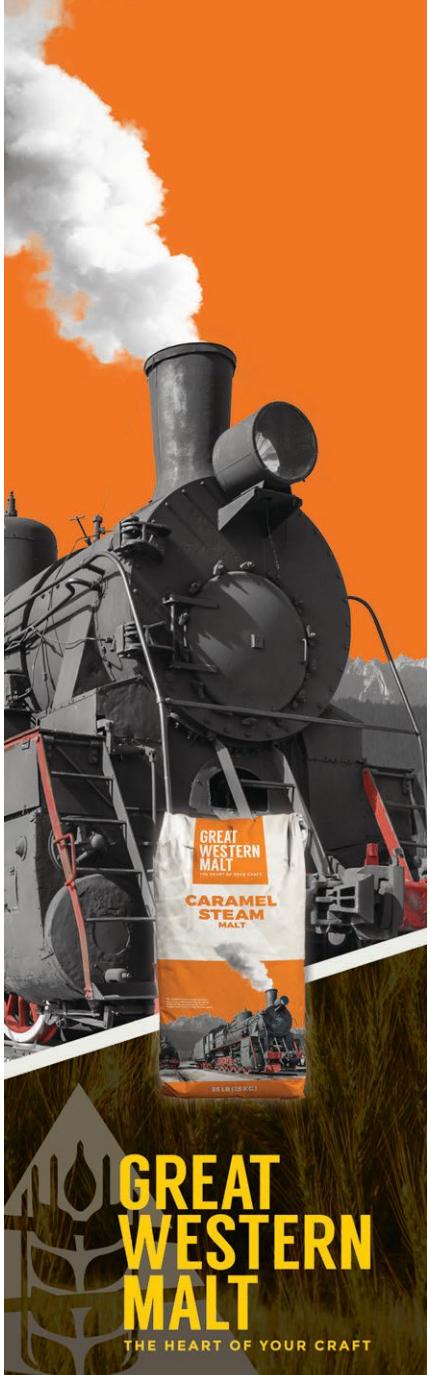
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welcoming us for the three-day duration of the event. And, of course, many thanks to the judges and clubs who participated, especially Somos Cerveceros and Club de Cerveceros Caseros de Uruguay for all their hard work. We'd like to recognize the efforts of each reception center present from the nine South American countries invited to the contest, every brewer who participated and sent in entries, and members of Chilebruers who coordinated and executed all aspects of the event.

"A special thanks goes to the bars Mossto Brewfood and Cerveza Loom who welcomed us for the social activities alongside the awards ceremony, to Cerveza Spohquienes who hosted our awards ceremony, and to Antilhue Cerveza Artesanal for receiving and storing beer entries prior to judging. Thanks to Pegas Beer Dispenser Draft Systems and Beer Yakima for providing the awards for Best Brewer and Best Beer respectively, to Patagonia Malt who helped us provide some of the supplies for the commemorative beer, and to our other participating event sponsors: Mundo Cerveceros, Yeast Kayta, Club De La Barba, Insumos Antilhue, Yeast Lallemant, Navarro y Cia. - Brewery Supplies, Pegas Draft Systems and Almacen Cerveceros."

Lastly, Hidalgo wanted to offer a word of support for fellow brew clubs in South America to keep this rotating competition going by stepping forward as host for the next event. "We urge South American homebrew clubs and associations, whether they are old or new, to step up and volunteer to organize the 3rd South American Homebrewers Cup in their own country. The Chilebruers Homebrew Club extends its full support, help, and collaboration with anyone willing to accept the challenge in years to come."

Best Beer winner Rodrigo Campos Oliveira, a dentist by profession, lives in Fortaleza, in northeastern Brazil. He has been brewing since 2011 but has immersed himself deeply in the hobby and now teaches homebrewing and beer sommelier classes in Brazil, in addition

to his full-time work. He's made over 130 beers in 60 different styles and was the 2017 "panela de ouro," the most awarded brewer in the National Homebrewing Contest of ACervAs, the Brazilian association of homebrewers—an honor analogous to the Ninkasi award at the AHA National Homebrew Competition.

At that competition, he won a gold medal with the same dragon fruit and guava beer he entered for the South American Homebrewers Cup, a gold for a barleywine aged in Amburana wood, a silver for a New England IPA, and a bronze for a Berliner weisse with pineapple and mint. The force of creative brewing is strong with this one.

Rodrigo is also very active in the rapidly growing homebrew club scene in Brazil. "I was one of the founders of ACervA Cearense, the homebrew club in my state affiliated with ACervA Brazil," he explains. "Our state association was founded in 2014, and I was president for the first three years. Today our ACervA Cearense has more than 140 members, and we are very active and growing. Homebrewing has grown a lot in Brazil. My course here in Fortaleza has already led to the formation of more than 32 classes of new homebrewers in the last three years."

For the Copa Sudamericana de Homebrewers competition, his entry choices were limited. "I sent in two entries, the Berliner with guava and dragon fruit and an India pale lager. I won medals with both, with the IPL scoring silver. I had a lot of different beers I could have submitted, but only these two fit the competition style categories. I knew about the contest only one week before the submission deadline, so it was close."

"I called the BOS Berliner "Psychedelic Weisse" because of the pink/purple color. It has an intense aroma of guava and the vibrant pink color of mild-tasting dragon fruit. I'd never tried a beer with dragon fruit before, but I had tasted Berliner with guava and felt it could use a little more color. The result was perfect for the hot climate in my

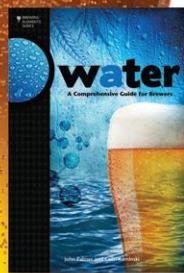


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town because of the combination of acidic bite and high carbonation.

"I brew all styles, but I end up doing more sours and IPAs. To make high-quality beers, I recommend attention to detail on fermentation, particularly pitch rate, wort oxygenation, and fermentation temperature control. Good recipes and good ingredients are important, but process is much more so."

Best Brewer and overall contest champions Juan Manuel Santos and Tomás José Avalos began their brewing odyssey in their Argentina hometown of Olavarria in 2013. Inspired by the burgeoning craft beer scene, the two watched some brewing tutorials on the internet, cobbled together a brew system out of a 40-liter aluminum kettle, a camping fridge-conversion mash tun, a washing machine pump, and a thermometer. But they soon recognized there was a little more to it, and that they weren't quite ready to be producing top-quality beer.

"After a few brews, we decided to stop brewing and to really study the brewing process," they admit. "It was a good choice. During that time we made a new brew system with one goal in mind: to dominate every variable of the brewing process."

In 2014, the pair moved into a house in Buenos Aires' Abasto neighborhood, and it was there that the new brew system came to life. This one used a 90-liter mash tun, a 90-liter hot liquor tank, and a 120-liter kettle, all stainless steel. "We use a two-stage cooling system with a plate chiller, and then an ice bath immersion coil to chill to proper fermentation temperatures. Fermenters are 110-liter plastic conicals inside a thermostat-controller refrigerator." They started with one fridge, but this quickly grew to three "and a [temperature-controlled] freezer to clarify our fruit beers," the two added. "The extra refrigeration allows us to brew four to six times per month."

With this kind of volume, the pair's hobby soon expanded to a commercial venture. "We sell the beer under the brand name Bacota," Santos and Avalos

The advertisement features the Uinta Brewing Co. logo in large white letters against a red background. Below the logo are several cans and a bottle of Uinta beer. The cans shown are Lime Pils, Hop Nosh IPA, and Golden Ale. The bottle is also labeled Hop Nosh IPA. To the right of the products is a circular badge with the text 'BREWED IN UTAH' and 'UT'. Below the badge, it says 'GOES WELL WITH Anywhere'. At the bottom, there is text about being proudly brewed in Salt Lake City, Utah, and links to their website and social media.

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explained. "We've won two silver medals for Bacota beers at the Argentinian Cup in 2016 and 2017. One was for an imperial saison with pineapple and the other for a tamarind witbier."

The two are part of the 1,500-member Somos Cerveceros association in Argentina that's been growing since 2007 and promotes beer culture and training in the brewing arts. It also hosts its own annual, three-stage cup competition. "The homebrewer that gets top qualification on all three stages is named Homebrewer of the Year," they stated. "Every year we have an end-of-the-year party that rotates locations throughout the country. Somos Cerveceros invites internationally recognized speakers to present, including Charlie Papazian, Ray Daniels, John Palmer, Boris de Mesones, and others." AHA director Gary Glass presented at the 2017 event.

Brewing classic styles with tropical fruit seems popular with their fans, but they say they just brew the beers they like

to drink. "Saison, witbier, tripel, session and standard IPA, American pale ale, all with fruit. Sometimes we brew English styles like imperial stout or barleywine. We are also starting to brew mixed-fermentation beers with *Brettanomyces bruxellensis*, and we're looking at sours and wood-aged beers."

Regarding their best-of-show winning grapefruit IPA, they said, "This beer was inspired by one of our favorite commercial beers, Samuel Adams Rebel Grapefruit IPA. We happened to be fermenting an IPA when we tried it, so we decided to add some grapefruit with the dry hops. It won gold at the South America Homebrewers Cup, and with another gold and a bronze for a wit and our imperial pineapple saison, we earned top honors for homebrewers in 2017. The grapefruit IPA is a beer that highlights the attributes of citrus hop varieties with balanced, resinous flavors and aromas from the fresh, pink grapefruit pulp."

Santos noted that there are several keys to brewing this beer successfully, includ-



ON THE WEB
Read AHA member Garrett Garfield's personal account of the South American Homebrew Cup in this issue's online extra at HomebrewersAssociation.org/jfl8

ing keeping a BU/GU ratio of 0.6 to 0.7 and shooting for the lower bitterness range for the style, 40 to 45 IBUs. This will allow the pink grapefruit flavors to come forward, and allows the citrus fruit to add its own natural tartness, which in turn enhances hop bitterness. Aim for a dry hop level of 5 to 6 grams per liter (0.7 ounces per gallon), and a boil pH of 5.2 to 5.3. Use the very freshest hops and pink grapefruit. Add 50 to 70 ppm of calcium to help with yeast flocculation. Use low-alkalinity water, with a maximum of 60 ppm, and a sulfate to chloride ratio of 1:1. A good water profile would be 58 ppm calcium, 6 ppm magnesium, 75 ppm sulfate, 35 ppm sodium, 82 ppm chloride, 60 ppm bicarbonate, and 48 ppm alkalinity. A neutral American ale yeast with an attenuation of 80% works best.

Amaiah Turczyn is associate editor of Zymurgy.

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BREWERS PUBLICATIONS

ZYMBURG

KUDOS—BEST OF SHOW

AHA/BJCP Sanctioned Competition Program

August 2017

Beer and Sweat, 294 entries—*Joe Theobald, Bethel, OH.*
2º Concurso de Cerveja Artesanal da Amazônia, 35 entries—*Esau Samuel Lima Feitosa, Manaus, Brazil.*
Blessed Sacrament Sludge Puppy Homebrew Competition, 6 entries—*Bryan Gordon, South Jordan, UT.*
OC Mash Ups & Stereo Competition, 21 entries—*Paul Watson, Costa Mesa, CA.*
3rd Annual Champlain Valley Fair Homebrew Contest, 39 entries—*Chris Kesler, Essex Junction, VT.*
Beehive Brew-Off, 424 entries—*Bryan Gordon, South Jordan, UT.*

September 2017

Schooner Homebrew Championship, 257 entries—*Luke Fuchs, Wausau, WI.*
Concurso Aniversario 1 Ano CCBR, 53 entries—*Marcel Pastore, Rio de Janeiro, Brazil.*
Forever Grateful 2017, 20 entries—*Andrew Pinzhoffer, CA.*
1º Concurso de Cerveja Caseira Vale do Lúpulo, 55 entries—*Douglas Merlo, Blumenau, Brazil.*
DRAFT Brewfest, 174 entries—*Matthew White, Lincoln, NE.*
Maryland Craft Beer Competition, 199 entries—*Michael Piorunski, Salisbury, MD.*

Queensland Amateur Brewing Competition, 452 entries—*Craig Daniels, Queensland, Australia.*
NSW State Homebrewing Competition, 440 entries—*Barry Cranston, Sydney, Australia.*
Chili Challenge 2017: Benefit for the Rochester Boys and Girls Club, 10 entries—*Joe Eischen, Rochester, MN.*
Concurso Cerveceros Artesanal Ciudad de la Plata, 17 entries—*Mac Adden Juan, La Plata, Buenos Aires, Brazil.*
Western Brewers Conference, 26 entries—*Jackie Prince, Auckland, New Zealand.*
Southern Oregon Harvest Homebrew Competition, 27 entries—*Dan Shults.*
Picnic Belge, 52 entries—*Matt Chick, Lenexa, KS.*
Santa Cruz County Fair Homebrew, 34 entries—*Jason Hanlon, Gilroy, CA.*
Oklahoma State Fair Homebrew Competition, 147 entries—*John Mason, Oklahoma City, OK.*
Northshore on Tap, 20 entries—*Matt Martini & Kim Kelley, Slidell, LA.*
Fugetaboutit, 223 entries—*Dynamic Ale Artisans, Chattanooga, TN.*
UK National Homebrew Competition, 454 entries—*Sarah Pantry, Udry, UK.*

Rocktoberfest Homebrew Competition 2017, 172 entries—*Andy Johnson, Salem, OR.*
Victorian Amateur Brewing Championships (Vicbrew), 437 entries—*Ben Sharp, Melbourne, Australia.*
The Manhattan Homebrew Cup, 159 entries—*John DiSpirito.*
Tulsa State Fair Homebrew Competition, 95 entries—*David Thompson, Broken Arrow, OK.*
Blue Ridge Brew Off, 341 entries—*Joe Domm, Charlotte, NC.*
Concurso Cervejeiro Caseiro ACERVAES 2017, 28 entries—*Daniel de Castro Cupertino, Vitoria, Brazil.*
ViaSat Homebrew and Appetizer Competition, 28 entries—*Joel Magnuson, Vista, CA.*
Malt Madness XI, 277 entries—*Mike Todd, Norristown, PA.*
Home Brew for the Homeless, 11 entries—*Joe Reyna, Dayton, NY.*
Salt City Homebrew Competition, 121 entries—*William Gardiner, Honeoye Falls, NY.*
LJT's 12th Annual Rhymes & Vines Texas Music Festival and Homebrew Competition, 45 entries—*Shawn Graham, Fort Worth, TX.*
Cáceres Beer 2017, 28 entries—*Jan Colombini, Barcelona, Spain.*



2018 NATIONAL HOMEBREW COMPETITION

IMPORTANT DATES

Application Period	January 23–30
Beer Registration Period	February 5–14
First Round Shipping Window	March 19–30
First Round Judging	April 6–22

More info at HomebrewersAssociation.org/nhc



KUDOS—BEST OF SHOW

AHA/BJCP Sanctioned Competition Program

NOLA on Tap, 30 entries—Kevin Bergeron, New Orleans, LA.

2017 Black Forest Brewoff, 38 entries—Matt Harker, Johnson City, TN.

Country Brewer Home Brew Competition, 18 entries—Aaron Mendham, Port Macquarie, Australia.

Fresno Homebrew Competition, 47 entries—Gabe Garcia, Selma, CA.

Texas Mead Cup, 201 entries—Jeffrey Reilly, Houston, TX.

3º Concurso de Cerveja Artesanal do Distrito Federal - ACervA Candanga, 44 entries—Marcel, Brasilia, Brazil.

Roberts Cove Germanfest Homebrew Competition, 74 entries—Andy Scherzinger, Katy, TX.

Members of Barleyment & Beau's Oktoberfest 5th

Annual Homebrew Competition, 447 entries—

Frank Schneidawind, St-Lazard, QC.

2ª Copa Santafesina de Cervezas, 67 entries—

Hernan Castellani, Rosario, Argentina.

Costa Mesa Homebrew Crawl Competition, 25 entries—Cameron Kruth, Costa Mesa, CA.

1º Concurso Outubro Mágico de Cervejas Caseiras, 73 entries—Jonas Geiss, São Paulo, Brazil.

South Kildare Brewers Lager Competition,

43 entries—Jonathan Cody, Ireland.

Old Forge BIG Beer and Odd Ale Competition, 46 entries—Evan Rausch, East Peoria, IL.

CRAFT Homebrewer of the Year Competition 2, 9 entries—Tracy Broomfield, MI.

HAZtoberfest, 123 entries—Jessica Ihms, Rocky River, OH.

2017 Maryland Microbrewery Festival Homebrew Competition, 86 entries—Christopher Hanyok & Daniel Jacobs, Delmar, DE.

The Great Pumpkin Homebrew Competition, 8 entries—Lukas Snyder, Indianapolis, IN.

2017 Fresh Hop Ale Festival, 45 entries—Garret Burge, Kennewick, WA.

2017 Sonoma County Harvest Fair Homebrew Competition, 116 entries—Robbie Proctor, Pleasant Hill, CA.

Pacific Brewers Cup, 411 entries—James Hilbing, Redondo Beach, CA.

VEToberfest Brew-Off 2017, 17 entries—Glen Rauwerdink, Hingham, WI.

Valhalla: The Meading of Life, 94 entries—Carvin Wilson, Mesa, AZ.

Firefighter Homebrew Contest, 31 entries—Scott Rauvola, San Diego, CA.

Tangled Up In Brew, 16 entries—Scott Miller, Connellsville, PA.

Oktobersbest Homebrew Competition, 250 entries—Bob Hart, Ferndale, MI.

Brixtoberfest, 195 entries—Jeff Landers.

O'Zapft Is! Homebrew Competition, 188 entries—Matthew Cogburn.

Valdez Oktoberfest and Homebrew Competition, 45 entries—Elisha Logan, Anchorage, AK.

I Can't Believe It's Not Lambic kettle sour competition, 10 entries—Simon Finnegan, Dublin, Ireland.

Bayside Brewers Oktoberfest, 62 entries—Bryce van Denderen.

Anchor Town Homebrew Competition, 29 entries—Eli Logan, Eagle River, AK.

Jacktoberfest, 69 entries—Daniel Lack, Madison, MS.

New Zealand Federation of Amateur Winemakers and Brewers National Championship, 278 entries—Gavin Keyworth, Helensville, New Zealand.

October 2017

Brewtonic Homebrew Cup, 50 entries—Gearoid, Dublin, Ireland.

Big Muddy Monster Brew Fest Home Brew Competition, 100 entries—Michael Germany, Troy, IL.

NC Brewers Cup Homebrew Competition,

148 entries—Mark Klinger, Chapel Hill, NC.

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KUDOS—BEST OF SHOW

AHA/BJCP Sanctioned Competition Program

CPARC Foundation Home Brew Competition, 11 entries—*Jacob Hornick, Harrisburg, PA.*
Schnapp Hans Cup, 90 entries—*Mike Glatzel and Peter Thomas, Wauwatosa, WI.*
Hogtown Fall 2017 Intraclub Competition, 11 entries—*Terrie Vasilopoulos and Jonathan Freedman, Gainesville, FL.*
Crystal Coast Brew Off, 115 entries—*Brad Schuler, Wilmington, NC.*
Alaskan Homebrew Competition - Autumn Pour, 130 entries—*Michael Cragen, Anchorage, AK.*
1º Copa Andina, 12 entries—*Federico Colombo, Mendoza, Argentina.*
Forest City Beer Bout, 41 entries—*Thomas O'Neill, London, ON.*
Hangul Day Homebrew Competition, 34 entries—*Yoon Sungmin, South Korea.*
Australian Amateur Brewing Championship, 366 entries—*Ben Tearne, Perth, Australia.*
Good Beer Homebrew Competition, 65 entries—*Thomas Ahmann, University Park, MD.*
The Conical Cup, 164 entries—*Joseph Tulanowski, Freeland, PA.*
1º Concurso Homebrewer Córdoba, 41 entries—*Angel Gonzalez Fontan.*

Winnipeg Brew Bombers Pro/Am Brew Challenge, 430 entries—*Alex Cochran, Langley, BC.*
Nevada State Homebrew Competition 2017, 124 entries—*Lance Newlin, Sparks, NV.*
EdUCate! Oktoberfest IPA Challenge, 30 entries—*Nicholas Rakovec, San Diego, CA.*
GRiST 1st Annual Oktoberfest Competition, 82 entries—*Ryan Bertolas.*
Sower's Cup Homebrew Competition, 438 entries—*Marshall Van Tuyl, Kansas City, MO.*
12th Annual New England Regional Homebrew Competition, 435 entries—*Neil Kade, Woburn, MA.*
Oregon Brew Crew Fall Classic, 347 entries—*Jordan Folks, Portland, OR.*
Copa Festival de Cerveceros Artesanales de Colombia, 72 entries—*Alejandro Torres & Misaac Torres, Bogotá, Colombia.*
Ida Grove Wine & Bier Contest, 61 entries—*Tyler Aube, Alta, IA.*
Pitcher In The Rye, 80 entries—*Ryan Walker, Libertyville, IL.*
Barley & Hops Hoopla Homebrew Competition, 24 entries—*Kevin Marshall, Boonville, MO.*
VII Warszawskiego Konkursu Piw Domowych Im. Wojciecha Trzesniowskiego, 292 entries—*Maciej Palusinski, Warsaw.*

QUAFF Club Only Stouts vs. Porters, 19 entries—*Paul Bischeri & Patrick Martinez, San Diego, CA.*

Hoppy Halloween 20 - Scream! "What's your favorite scary brew?", 587 entries—*Delano Stein, Lakeville, MN.*

Greater Topeka Hall of Foamers Brew Bash, 193 entries—*Mike Tate, Topeka, KS.*

Arizona Fall Classic Homebrew Competition, 261 entries—*Jeff Skaggs, Phoenix, AZ.*

Salmonid HBC Grim Reaper Challenge, 23 entries—*Brian Ferwerda, Salmon, ID.*

SpookyBrew 2017, 190 entries—*Sean Hanna, Chicago, IL.*

Son of Brewzilla, 450 entries—*Goose Steingass and John Wicks, Wooster, OH.*

AIChE Beer Brewing Competition, 32 entries—*Team MMAIChE: David Couling, William Liechty & Scott Tippler, Midland, MI.*

November 2017

2017 SOBA National Homebrew Competition, 550 entries—*Steven Bellward, Wellington, NZ.*

2º Grande Taça BJCP Portugal, 11 entries—*Olivier Vincent, Vila do Bispo, Portugal.*

UNYHA's Bizarro Sixpack Comp 2017, 42 entries—*Ken Demarree, Buffalo, NY.*



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**AHA/BJCP SANCTIONED
COMPETITION PROGRAM CALENDAR**

For complete calendar, competition and judging information go to
HomebrewersAssociation.org/pages/competitions



Beer Judge
Certification
Program

January 5, 2018

Big Beers, Belgians & Barleywines Festival

bigbeersfestival.com

Breckenridge, CO

Entry Deadline: 12/9/2017

January 6, 2018

2º Concurso de Cervejas Caseiras Bier Vila

biervila.com.br/concurso/

Blumenau, Santa Catarina, Brazil

Entry Deadline: 1/2/2018

January 13, 2018

**Mea Cervisiam - Concurso de Cerveja
Caseira**

meacervisiam.com

Porto, Portugal

Entry Deadline: 10/31/2017

January 18, 2018

**The Beer Project - Museum of Fine Arts
St. Petersburg**

mfastpete.org

St. Petersburg, FL

Entry Deadline: 1/1/2018

January 19, 2018

Big Bend Brew Off

bbbo.nfbl.org

Tallahassee, FL

Entry Deadline: 1/6/2018

January 19, 2018

**Great Alaskan Beer and Barleywine
Festival**

Anchorage, AK

Entry Deadline: 1/19/2018

January 20, 2018

**St. Cloud Craft Beer Tour Home Brew
Competition**

Saint Cloud, MN

Entry Deadline: 12/16/2017

January 20, 2018

**Four Leaf Brewing's 2nd Annual Capture
the Tap!**

fourleafcraftbeer.com/capture-the-tap

Clare, MI

Entry Deadline: 1/17/2018

January 20, 2018

**Bataille des Bières Homebrew
Competition**

Lafayette, LA

January 20, 2018

Monk Melee VII

aleiens.com/page/monk-melee-vii

Hulmeville, PA

Entry Deadline: 1/13/2018

January 20, 2018

Winterbrew 2018

squarekegs.com

Chicago, IL

Entry Deadline: 1/5/2018

January 21, 2018

Archibald's Brew Off

knifehandcup.com

Fort Worth, TX

Entry Deadline: 1/6/2018

January 23, 2018

Barrilito de Oro

microbrewfestpanama.com/barrilitodeoro/

Panama City, Panama

Entry Deadline: 12/31/2017

January 26, 2018

Minnesota Mashout

mashout.org

Saint Paul, MN

Entry Deadline: 1/12/2018

January 27, 2018

**Great Kiwi Beer Fest Home Brew
Competition**

homebrewhq.co.nz/GKBF-Home-Brew-Comp-2018_ep_41.html

Christchurch, Canterbury, New Zealand

Entry Deadline: 1/12/2018

January 27, 2018

**EI Dorado County Fair Homebrew and
Commercial Competitions**

eldoradocountyfair.org/brew-competition.html

Placerville, CA

Entry Deadline: 1/16/2018

January 28, 2018

**Boss Hop - IPA Championship of New
England**

ipa.wort.org

Boston, MA

Entry Deadline: 1/12/2018

February 2, 2018

Barcelona Beer Challenge

Barcelona, Catalonia, Spain

February 3, 2018

Domras Cup Mead Competition XX

savannahbrewers.com/domras-cup/

Savannah, GA

Entry Deadline: 1/24/2018

February 3, 2018

II Concurso Homebrew Birras Baixas

facebook.com/concursobirrasbaixas/

Vigo, Spain

Entry Deadline: 1/24/2018

February 9, 2018

Great Northern Brew Ha Ha

greatnorthernbrewhaha.brewcomp.com

Duluth, MN

Entry Deadline: 1/29/2018

February 9, 2018

Homebrew Alley XII

homebrewalley.com

Long Island City, NY

Entry Deadline: 1/28/2018

February 10, 2018

Romancing the Beer

romancingthebeer.com

Thousand Oaks, CA

Entry Deadline: 1/26/2018



For an up-to-date calendar
of AHA and BJCP events
go to the Events section of
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AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

February 17, 2018

War of the Worts

keystonehops.com/wotw.php

Montgomeryville, PA

Entry Deadline: 2/4/2018

February 17, 2018

Sweethearts Revenge

weizguys.com

Loveland, CO

Entry Deadline: 2/3/2018

February 17, 2018

2018 Midwinter Homebrew Competition

midwinterhbc.com

Milwaukee, WI

Entry Deadline: 1/27/2018

February 17, 2018

KCBM 35th Annual Competition

kcbiermeisters.org/comp/

Kansas City, MO

Entry Deadline: 2/2/2018

February 24, 2018

MHK Hail the Ale Homebrew Competition

Manhattan, KS

Entry Deadline: 2/19/2018

February 24, 2018

BeerMe BrewCup

facebook.com/groups/BeermeBrewClub/

Riverside, CA

Entry Deadline: 2/23/2018

February 25, 2018

Great Basin Brewoff

reggiebeer.com

Reno/Sparks, NV

Entry Deadline: 2/11/2018



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HOME BREW CON 2018

SM

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HomebrewCon.org
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National
Homebrewers
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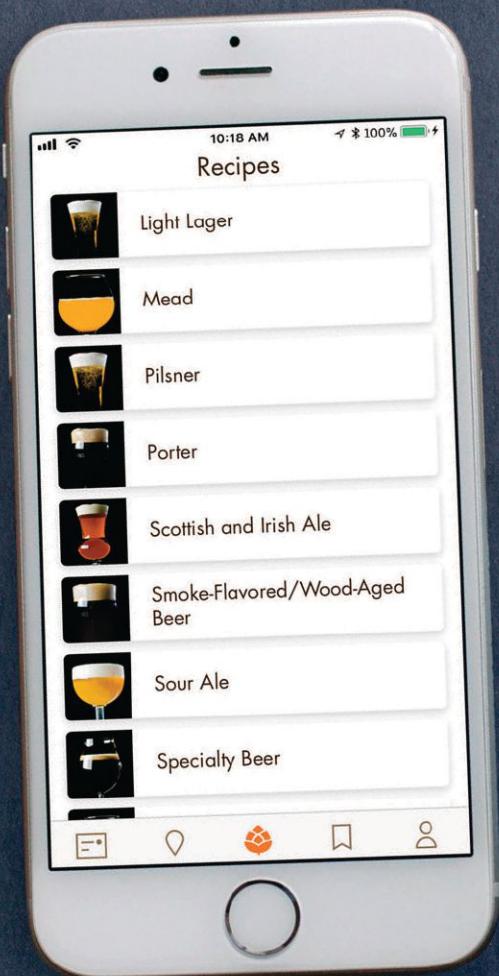
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BREW GURU®





COMMERCIAL CALIBRATION

One way beer judges check their palates is by using commercial “calibration beers”—classic versions of the style they represent. Zymurgy has assembled a panel of four judges who have attained the rank of Grand Master in the Beer Judge Certification Program. Each issue, they score two commercial beers (or meads or ciders) using the BJCP scoresheet. We invite you to download your own scoresheets at bjcp.org, pick up a bottle of each of the beverages and judge along with them in our Commercial Calibration.



What do you think of when you hear someone mention “fruit beer?” For many of us, the term brings back unwelcome memories of sticky-sweet blueberry wheat and pumpkin ale that shares more in common with pie than beer. If you got into homebrewing and craft beer in the 20th century, you might be forgiven for being a little wary of fruit beer.

But, good fruit beers—*really* good ones—combine an excellent base beer with the best of nature’s harvest so deftly that the drinker often doesn’t know where one ends and the other begins. In this installment of Commercial Calibration, our master panel evaluates two fruit beers that might just convert a few members of the “I don’t like fruit beer” crowd.

Funkwerks is a saison-focused brewery in Fort Collins, Colo., whose lineup features a number of medal winners, including a flagship saison that has twice won gold

at the Great American Beer Festival®. Raspberry Provincial also counts itself as a GABF winner, having taken gold in 2014 in the Belgian-Style Fruit Ale category.

According to the brewery, Raspberry Provincial was born in the summer of 2013 when brewers added a bunch of raspberries to a batch of sour ale that didn’t hit the target original gravity. “The end result was so delicious,” they say, “we ended up brewing it year-round. This delightfully tart fruit beer is refreshing, with a citrusy berry aroma which transitions to a subtly sweet and tart finish.”

Raspberry Provincial is 4.2% ABV and available in Colorado, Arizona, Texas, Iowa, Minnesota, and not one, but two Dakotas. It’s available on draft, in 750 mL bottles, and in 4-packs of 330 mL bottles.

About 1.5 miles (2.5 km) directly to the northwest of Funkwerks lies New Belgium Brewing Co., a little operation that maybe a few readers have heard of. New Belgium is most famous for Fat Tire ale and a barrel program that has given us such sour delights as La Folie and Transatlantique Kriek.

 **Brew your best kettle sour with Funkwerks’ top 5 tips for kettle sours:** HomebrewersAssociation.org/funkwerks-sours/

In recent years, though, New Belgium has expanded its product line about as quickly as it has widened its distribution footprint, which now includes all 50 states. Among the brewery’s most recent year-round offerings is Citradelic, an American IPA that complements citrusy hops with a generous dose of tangerine.

OUR EXPERT PANEL David Houseman, a Grand Master VI level judge and competition director for the BJCP from Chester Springs, Pa.; Sandy Cockerham, a Grand Master III level judge from Indianapolis, Ind. and an associate exam director and Midwest Representative for the BJCP; Scott Bickham, a Grand Master III judge from Corning, N.Y., who has been exam director or associate exam director for the BJCP since 1995; and Gordon Strong, a Grand Master IX judge, principal author of the BJCP Style Guidelines, and president of the BJCP board who lives in Beavercreek, Ohio.



Funkwerks
funkwerks.com

New Belgium Brewing Co.
newbelgium.com

BJCP Style Guidelines
bjcp.org

Commercial Calibration Index
HomebrewersAssociation.org/pages/zymurgy/commercial-calibration

Not long ago, the idea of adding fruit to an IPA would have been a little fringe. But today’s brewers are finding ways to infuse all kinds of vegetation into hop-forward ales with excellent results. That success is in part due to fruity hops that share flavor and aroma attributes with citrus and tropical fruits.

According to the brewery, Citradelic is made from pale and caramel 120 malts and is hopped with—take a deep breath—Nugget, Crystal, Centennial, Azzaca, Cascade, Citra, Chinook, Galaxy, Mandarina Bavaria, and Simcoe. Tangerine-infused orange peel rounds out this 6% ABV, 50 IBU ale.

Citradelic is available on draft and in 12-ounce bottles and cans.

THE SCORES



Raspberry Provincial—Funkwerks, Fort Collins, Colo.
BJCP Category: 28C, Wild Specialty Beer

THE JUDGES' SCORES FOR RASPBERRY PROVINCIAL



DAVE HOUSEMAN



SANDY COCKERHAM



SCOTT BICKHAM



GORDON STRONG

Aroma: Significant raspberry aroma with additional herbal notes, somewhat hibiscus-like. Some bready malt undertones. No hop or alcohol aroma. No diacetyl or DMS. No acetic acid sourness or other funky aromas. A slight lactic sourness lies under the malt and raspberries. (10/12)

Appearance: Hazy to cloudy clarity—OK for the style. Pink/red color, again OK given the use of raspberries. Dense, creamy, pinkish, long-lasting head. (3/3)

Flavor: Raspberry flavor is assertive and fresh, along with moderate to high lactic sourness. There are lemony, herbal notes similar to lemon verbena. Good, moderate supporting bready malt. Some woody, almond-like notes, likely from raspberry seeds. Light, lingering astringency. Very well balanced with a refreshing, fruity finish. No noticeable alcohol flavor. No diacetyl or DMS. (17/20)

Mouthfeel: Light to medium body. Spritzy carbonation. Puckering sourness with a bit of astringency. No alcohol warming. (5/5)

Overall Impression: Light, refreshing and wonderfully raspberry. Just the right amount of sourness to make this a snappy, crisp ale and balance residual sweetness. Herbal, lemony notes add complexity. A very good interpretation of a classic Mariage Parfait. For a wild specialty beer, a bit more complexity with the sourness, such as some acetic acid, or use of Brettanomyces, would be welcome, but this still an excellent beer as made. This would pair well with a light goat cheese and fruit tossed salad with a raspberry vinaigrette, perhaps even made with some of the beer. (8/10)

Total Score: (43/50)

Aroma: Wow. The nose is medium high raspberry and it smells like sticking your nose in a just-picked bowl of fresh, ripe raspberries! I also note a light, perfume-like floral character. There is no observable hop aroma. I perceive a hint of tartness in the nose and a very low level of neutral base malt. So very inviting! (11/12)

Appearance: This beer is a lovely pink color and slightly hazy in appearance. The thick, pink-tinged head is dense and rocky. Head retention is moderate. (3/3)

Flavor: Dry raspberry aroma up front at a medium to medium-high level. Very low bitterness and no noticeable hop flavor. I get a slight note of berry seed or a green leafy flavor that adds an interesting note to the overall flavor. Again, malt is pretty low, and there is just enough to underpin the other flavors. There is low, clean tartness, and the finish is quite dry. (17/20)

Mouthfeel: The body is light to medium, and the carbonation is medium-high. The bone-dry finish is in part due to a hint of tannins from the raspberries. (4/5)

Overall Impression: This is a delicious, lightly soured fruit beer that exhibits spot-on raspberry character and a light, refreshing level of tartness. To me, it is a sessionable sour that I could easily enjoy several of and not have to run for the antacid bottle. This would be great for pairing with food. It's summertime in a glass! (9/10)

Total Score: (44/50)

Aroma: Intense raspberry aroma underpinned with acidic and earthy notes. The fruit character is very fresh. There is a light honey-like sweetness in the background, and I also pick up light leathery and oaky notes. I'm not sure if Brettanomyces was one of the yeast components, but the leathery flavors add complexity to the mother lode of raspberries. (10/12)

Appearance: Reddish-pink in color with a tightly beaded white head with good retention. There is a moderate haze likely due to roused yeast that didn't have time to settle after shipping. (3/3)

Flavor: The wild character that was somewhat subtle in the aroma is quite pronounced here. Lactic acid gives a clean sourness that enhances the acidity from the fruit. The earthy notes from the berries marry well with the leathery notes from the yeast. The bitterness is appropriately low to let the tannins from the fruit provide a dry, refreshing finish. (18/20)

Mouthfeel: Moderate carbonation gives some creaminess in spite of the light body and low residual sugar. The acidity coats the mouth and lingers pleasantly, along with a light astringency from the copious amount of fruit. (4/5)

Overall Impression: This successful experiment yielded a refreshing and thirst-quenching beer. The raspberries are more dominant than the yeast character in the aroma, but the roles are reversed in the flavor. I would like a little more funkiness, but that varies quite a bit in the Berliner weisse base style. Otherwise, the balance and complexity are outstanding. Well done! (9/10)

Total Score: (44/50)

Aroma: High raspberry aroma with a light lactic sourness. Soft grainy notes in the background. Fruit dominates everything. Light sweetness perceived. Seems fairly clean. (9/12)

Appearance: Tall pink head, tiny bubbles, fair persistence. Hazy, cloudy, opaque. Orange-ish pink color. (2/3)

Flavor: Moderate acidity with a strong raspberry flavor. Clean fruit character. Acidity has a soft, rounded quality, not sharp. Finish is full, with a light tartness offset by fruit and sweetness. No bitterness is apparent, just sourness. Clean fermentation. Clean lactic acidity, just low. Aftertaste has a sweet and sour fruit flavor. The malt is noted as a light, supportive grainy flavor. (16/20)

Mouthfeel: Medium to medium-full body. Medium-high carbonation. No alcohol warmth, not astringent. (3/5)

Overall: The sourness level isn't much beyond what raspberries would give you naturally. The fruit is very clean, but I wonder if this would be better as a raspberry wheat beer. I think it would drink better if the body was lighter and the carbonation higher. Great fruit flavor, though. Very enjoyable, but likely won't excite sour beer fans due to the restrained acidity. (7/10)

Total Score: (37/50)



THE JUDGES' SCORES FOR CITRADELIC TANGERINE IPA



Aroma: Complex, high hop aroma, largely citrus but not focused on any one hop. This is backed up with a blending of fruity notes of tangerine and orange. The fruity aromas seem to be a mix of hops, added fruit, and fermentation esters. Sweet malt with hints of caramel support and balance the hops and fruit. Low alcohol aroma. No DMS or diacetyl. Very clean, well made ale aroma. (10/12)

Appearance: Bright to brilliant clarity. Well carbonated. Golden color. Rocky, white, long-lasting head. (3/3)

Flavor: Sweet malt with balancing, bold hop bitterness that isn't overbearing. High hop flavor is very complex and blends well with assertive tangerine and noticeable orange peel emphasis. Fruitness from hops, added fruit, and fermentation. Some alcohol is noticeable but subtle. No DMS or diacetyl. Finishes a bit sweet with lingering bitterness. Very well balanced; malt-bitterness balance is nearly ideal, not one-dimensional as with many contemporary IPAs. (18/20)

Mouthfeel: Medium body. Lingering bitterness without the astringency of heavy hop usage. Warming alcohol. Some tongue coating mouthfeel but not slick or distracting. (5/5)

Overall Impression: A very well-balanced IPA. The tangerine and orange peel have been blended very well with the choice of hops used. Could have been just a tad drier so I could drink more in a seating. While this beer would be enjoyable to simply drink with friends, it would pair well with a bittersweet chocolate dessert such as warm chocolate lava cake. (9/10)

Total Score: (45/50)

Aroma: Initially, this beer presents with a moderate citrusy character, underpinned by a light citrus pith/peel aroma. The moderate hop aroma is a mix of citrus, some herbal dankness, and a slightly catty character. Underneath the hops and fruit, I note low bready malt in support. I perceive a trace of fruity and floral (rose-like) esters. (8/12)

Appearance: The beer is medium gold color and very clear. A moderate ivory head is composed of a mix of fine and frothy (mixed-size) bubbles. Head retention is good and leaves some light lacing on the glass. (3/3)

Flavor: The malt character is moderate and composed of some grainy and bready tones. Hop flavor is moderate, and the fruity notes from the nose aren't present nearly as much; I just perceive herbal, grassy flavors. There is a low pith/peel tangerine note. I also note some low vegetal flavors. The medium bitterness is lower than I expected for the style. (14/20)

Mouthfeel: The beer is a little bigger than medium bodied with medium-high carbonation. I note a pleasant carbonic bite. There is moderate astringency in the off-dry finish. (4/5)

Overall Impression: This is an enjoyable beer, but it tastes a little faded. The hops come across with a little excess vegetal and grassy qualities. The tangerine is pretty subtle. Stylistically, it seems more like an American pale ale than an American IPA. Very easy to drink. I would have liked a little more pronounced hop character and a bit more of the tangerine aroma and flavor in the mix. (7/10)

Total Score: (36/50)

Aroma: The initial aroma has a moderate citrus character reminiscent of freshly sliced tangerines. Underneath, there are moderately low earthy notes from hops as well as lightly toasted and honey notes from the malt. I pick up a little alcohol, but more as sweetness. The fruit character is interesting, but it overshadows the malt and hop character expected in the base IPA style. (9/12)

Appearance: Amber in color with excellent clarity and moderately creamy head that lasts well. Very nicely conditioned. (3/3)

Flavor: The initial impression is low malt, with biscuit notes, very light caramel, and a honey-like sweetness. It transitions smoothly to the citrus and tangerine character, with American hops providing synergy as well as some floral and earthy notes. The finish is dry with a moderately high bitterness. Some harshness may be a consequence of using fruit peel. (16/20)

Mouthfeel: The carbonation and creaminess are both moderate and on the mark for the style. There is a light and pleasant alcohol warmth. The astringency is a little high, with a little soapy character from the tangerine peel. (3/5)

Overall Impression: This well crafted IPA that blends citrus components of hops and tangerine peel. The balance shifts to the latter, particularly in the aroma and in the mouthfeel, where it elevates the astringency beyond the level of most IPAs. Just using the zest might mitigate the slight harshness in the finish. Overall, it is an interesting and pleasant beer to sample, and one I would like to find on draft. (8/10)

Total Score: (39/50)

Aroma: Huge, fresh fruity and hoppy nose. Grassy hops as if from dry hopping. Big citrus and tropical fruit character. Mild malt, relatively neutral. Clean fermentation. Complex citrus with an interesting spicy-orange character. (10/12)

Appearance: Clear. Tall white head with good retention. Deep golden color. (3/3)

Flavor: Moderate bitterness, not very strong. Full malty palate, neutral grain character. Strong citrus flavor, similar in character to aroma. Relatively dry but has a full finish. Lingering citrus flavor with some pithy harshness. Clean fermentation. Citrus flavors dominate with some spicy notes accentuating the citrus complexity. (13/20)

Mouthfeel: Medium to medium-full body, kind of heavy and dextrinous. Medium-high carbonation. Very light warming but does not have the impression of much strength. Light astringency, as if from fruit pith. (3/5)

Overall: Balance seems a bit closer to a pale ale than an IPA—bitterness is low in the balance, and the citrus steps on the hop flavor. The fuller body and heavier malty finish also seem more like a pale ale. The fruit aspects are interesting, but the nose is better than the taste due to the pith-like harshness that affects the flavor and aftertaste. Clean fermentation character is admirable. (6/10)

Total Score: (35/50)



Why Do They Brew?

Here is a story I wrote 11 years ago. For whatever reason, I never had the opportunity to share it in *Zymurgy*. It is always a relevant story to tell.

In the autumn of 2007, I sit with Michael Plank at his brewery and restaurant in the very small village of Laaber, Germany. We are drinking his beer. He is the 16th generation of first-born sons named Michael. His then five-year-old first son Michael became the 17th generation of family brewers going back to the year 1617. His is a small brewery, brewing about 8,500 barrels of beer a year. Its size is comparable to a healthy sized microbrewery in the USA. Hefeweizen, bock, and helles lager are a few of his specialties. I love it.

Michael calls his assistant, and upon his arrival, Michael pulls a key out of his pocket and hands it to him. A bit of German is spoken, and I realize there are some beers under lock and key behind a century-old door, somewhere here at Private Brewery Plank. The assistant returns with a small pitcher brimming with something I quickly gather is very special. It is about to begin snowing outside. The next thing I know, I am marveling at his 20-year-old, barrel-aged weizenbock (wheat bock). It has hints of tamarind and cherry with a warming sherry- and raisin-like character. A gentle sourness and the mustiness of oak leave a lasting impression.

Behind every glass of beer are people who brew it. Why do they brew? Perfection, harmony, and pleasure. That sums it up rather nicely.

I've met thousands of brewmasters the world over, and regardless of language, culture, geography, or politics, brewers who make memorably great beer have these things in common. Whether they



are professional brewmasters or at-home brewers, passion is what they do. Brewers do not simply put a bunch of ingredients together and "make" beer.

Because the brewing process is what it is, people who brew beer are creators. Creators develop a sense of ownership. That is a good thing. Creating beer is a nurturing process that begins with choosing and gathering ingredients. It continues with knowledgeably combining and magically processing them. Beer develops its personality through staged fermentation and a maturing process. Patience, foresight, and knowing contentment are observed signposts.

Once the beer is ready, brewers maintain their ownership by overseeing the presentation of their beer in bottles, cans, kegs, and glassware. They even persist to the extent of designing the experience called enjoyment. Brewers find it hard to let go. They are always concerned about the quality of the beer and the quality of the experience. Real brewers never lose sight of the beer

drinkers who enjoy their beer. Every single beer enthusiast who falls in love with a particular beer brand knows the feeling of identifying with a beer made with passion. That's because every beer is a living liquid infused with the personality of the brewer and the people behind it.

I know this firsthand.

Why do I brew? I have been a brewer for 48 years. It's still fun. I love the routine of planning and preparing the ingredients in the days before. There's the anticipation of waking up in the morning and going out to my brew garage. If it's summer, I open the garage door, and the sun comes streaming in from the horizon and takes the chill out of the early morning air. In the freezing cold of winter, the anticipation of warmth and humidity generated by steaming kettles creates uncompromised comfort. I mash in, set the timer, and have breakfast. I'm brewing. The aromas of malt and hops soon fill the air, and I simply love it.

Weekday Bock (All-Grain)

Batch Size: 5 US gallons (19 L)

Original Gravity: 1.066 (16.5 B)

Final Gravity: 1.016 (4 B)

Bitterness: About 34 IBU

Color: Approximately 19 SRM (38 EBC)

Alcohol: 6.8% by volume

MALTS

9 lb.	(4 kg) German Pilsner malt
1 lb.	(454 g) Belgian aromatic malt
12 oz.	(340 g) German Caramunich malt
4 oz.	(113 g) German acidulated malt (<i>Sauermalz</i>)
2 oz.	(56 g) German debittered black malt

HOPS

1.5 oz.	(42 g) German Hallertauer, 4.5% a.a. @ 60 min (6.8 HBU/190 MBU)
1.5 oz.	(42 g) German Hallertauer Hersbrucker, 3.3% a.a. @ 15 min (5 HBU/140 MBU)
0.5 oz.	(14 g) Crystal @ 1 min
0.33 oz.	(10 g) Crystal, dry hop

YEAST

German or Bavarian lager yeast. I use White Labs Cry Havoc.

ADDITIONAL ITEMS

1/4 tsp.	(1 g) powdered Irish moss @ 10 min.
0.1 g	zinc-fortified yeast as nutrient @ 10 min
3/4 cup	(175 mL) corn sugar (priming bottles) or 0.33 cups (80 mL) for kegging

BREWING NOTES

A step infusion mash is employed to mash the grains. Add 11 qt. (10.5 L) of 140° F (60° C) water to the crushed grain, stir, stabilize, and hold the temperature at 132° F (56° C) for 30 minutes. Add 5.5 qt. (5.2 L) of boiling water, add heat to bring temperature up to 155° F (68° C), and hold for about 30 minutes. Then raise temperature to 167° F (75° C), lauter, and sparge with 3.5 gal. (13.5 L) of 170° F (77° C) water. Collect about 5.5 gal. (21 L) of runoff. Add 60-minute hops and bring to a full and vigorous boil.

The total boil time will be 60 minutes. When 15 minutes remain, add the 15-minute hops. When 10 minutes remain, add the Irish moss and zinc fortified yeast. When 1 minute remains, add the 1-minute hops. After a total wort boil of 60 minutes, turn off the heat and place the pot (with cover on) in a running cold-water bath for 30 minutes. Continue to chill in the immersion or use other methods to chill your wort. Then strain and sparge the wort into a sanitized fermenter. Bring the total volume to 5 gal. (19 L) with additional cold water if necessary. Aerate the wort very well.

Pitch the yeast when temperature of wort is about 70° F (21° C). Once visible signs of fermentation are evident, ferment at a temperature of about 55° F (13° C) for one to two weeks, or until fermentation shows signs of calm and stopping. Rack from primary to a secondary and add the hop pellets for dry hopping. Lager the beer at temperatures between 35 and 45° F (2–7° C) for 4 to 8 weeks.

Prime with sugar and bottle or keg when complete.

This is what I do 12 to 15 times a year for enjoyment. Yes, I do other things for enjoyment too. But, tomorrow I get to immerse myself in the world of beer and brewing for a few hours. I can't help but think of the millions of others throughout history who have gone through the same routine. I imagine that in each brewer's world there is the same sense of enjoyment, accomplishment, and creation repeated over the centuries.

Then aromas inspire familiarity and my anticipation evolves. I am spending my time making something really good, and not only will I really like this stuff, but I'll get to share it with friends who, too, will magically feel the contentment, fun, and excitement I experienced when I brewed it.

People brew for different reasons. For some, it's a daily job and great responsibility. For others, it's also about giving back to friends. Or, perhaps it's about making a type of beer that can't be found otherwise.

And then there's always the beer you personally love to enjoy.

Yes, there are a few other objective reasons why I brew. I make a wide variety of lagers and ales and replicate classic brands or beer experiences. Others are new, fringe, and experimental.

I love the taste of my beer because it is fresh and stable, and I can't find the qualities of my homebrewed beers in commercially available versions. You see, I tend to personalize and "tweak" the classically and deliciously available commercial beers I like with customized combinations of specialty malts, a wide variety of distinctive hops, and other unusual ingredients. There is another objective reason, and that is, well, homebrewing is part of my job. Brewing enhances my perspective with the work that I do. I just so happen to like working late.

Some friends call me fussy. Well, then, fussy I am. I love the opportunity to cus-

tomize great brews to my own taste. It's a perpetual dance.

It has been almost 50 years since my first batch of homebrew. I haven't tired of the brewing hobby, perhaps because I keep the process accessible and relatively simple. Hands-on brewing is not a hindrance, but rather a catalyst for enjoyment.

I feel kinship with every beer I enjoy that has been brewed by others because I feel the passion and know the story of what's in my glass, no matter who made it. Keeping it fun and enjoyable is a good thing. It has enhanced my enjoyment of all beer and has kept me brewing for 48 years, one 5-gallon batch at a time.

Let's cut the shuck and jive and get on with the recipe.

Charlie Papazian is founder of the American Homebrewers Association and the author of *The Complete Joy of Homebrewing*.

Weekday Bock (Malt Extract)

Batch Size: 5 US gallons (19 L)
Original Gravity: 1.066 (16.5 B)
Final Gravity: 1.016 (4 B)
Bitterness: About 34 IBU
Color: Approximately 19 SRM (38 EBC)
Alcohol: 6.8% by volume

MALTS

8.25 lb. (3.7 kg) light malt extract syrup or 6.6 lb. (3.0 kg) light dried malt extract
1 lb. (454 g) German Caramunich malt
3 oz. (84 g) German acidulated malt (*Sauermalz*)

HOPS

2 oz. (56 g) German Hallertauer, 4.4% a.a.
@ 75 min (8.8 HBU/106 MBU)
1.5 oz. (42 g) German Hallertauer Hersbrucker, 3.3% a.a. @ 15 min (5 HBU/140 MBU)
0.5 oz. (14 g) Crystal @ 1 min
0.33 oz. (10 g) Crystal, dry hop

YEAST

German or Bavarian lager yeast. I use White Labs Cry Havoc.

ADDITIONAL ITEMS

1/4 tsp. (1 g) powdered Irish moss @ 10 min
0.1 g zinc-fortified yeast as nutrient @ 10 min

3/4 cup (175 mL) corn sugar (priming bottles) or 0.33 cups (80 mL) for kegging

BREWING NOTES

Place crushed grains in 2 gal. (7.6 L) of 150° F (66° C) water and let steep for 30 minutes. Then strain, rinse with 3 qt. (3 L) hot water, and discard the crushed grains, reserving the approximately 2.5 gal. (9.5 L) of liquid to which you will now add malt extract and 75-minute hops. Bring to a boil.

The total boil time will be 75 minutes. When 15 minutes, remain add the 15-minute hops. When 10 minutes remain, add the Irish moss and zinc fortified yeast. When 1 minute remains, add the 1-minute hops. After a total wort boil of 75 minutes, turn off the heat.

Immerse the covered pot of wort in a cold water bath and let sit for 30 minutes or the time it takes to have a couple of homebrews.

Then strain out and sparge hops and direct the hot wort into a sanitized fermenter to which 2.5 gal. (9.5 L) of cold water has been added. If necessary, add additional cold water to achieve a 5 gal. (19 L) batch size. Aerate the wort very well.

Pitch the yeast when temperature of the wort is about 70° F (21° C). Once visible signs of fermentation are evident, ferment at a temperature of about 55° F (13° C) for one to two weeks, or until fermentation shows signs of calm and stopping. Rack from primary to a secondary and add the dry hops. Lager the beer at temperatures between 35 and 45° F (2–7°C) for 4 to 8 weeks. Prime with sugar and bottle or keg when complete.



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Zymurgy (ISSN 0196-5921, USPS 018-212) is published bi-monthly by the American Homebrewers Association, a division of the Brewers Association, with headquarters at 1327 Spruce Street; Boulder, Colorado 80302. The Editor is Dave Carpenter with address same as above. The annual subscription price is \$35.00 and \$43.00 with a membership to the American Homebrewers Association. The publication is wholly owned by the Brewers Association, a not-for-profit corporation. The purpose, function and not-for-profit status has not changed during the preceding twelve months, and the average number of copies of each issue during the preceding twelve and the actual number of copies published nearest to the filing date (September/October 2017 issue) are noted below.

This information taken from PS Form 3526, signed by Jason Smith, Art Director, and filed with the United States Postal Service in Boulder, Colorado.

Item No. from PS Form 3526	Extent and Nature of Circulation	Avg No. Copies each Issue in past 12 months	Actual No. Copies Of Single Issue Publishing Nearest to Filing Date
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	(2) Paid In-County Subscriptions	64.....	57.....
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c.	Total Paid and/or Requested Circulation (Sum of b).....	43,026.....	40,715.....
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e.	Total Free Distribution (Sum of d).....	1,890.....	1,804.....
f.	Total Distribution (Sum of c & e)	44,916.....	42,519.....
g.	Copies Not Distributed.....	1,399.....	1,391.....
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ADVERTISER INDEX

Adventures In Homebrewing.....	24	Desktop Labels.....	34	Maryland Homebrew.....	38
www.austinhomebrew.com		www.desktoplabels.com		www.mdhb.com	
American Homebrewers Association	64,82,87,88,94	FastBrewing & WineMaking	72	Memphis Convention.....	30
www.HomebrewersAssociation.org		www.thefastrack.ca		www.memphistravel.com	
Anton Paar GMBH	39	FERMENTIS By Lesaffre Yeast Corporation	47	Micro Matic USA Inc.....	84
www.anton-paar.com		www.brewwithferments.com		www.micromatic.com	
ANVIL Brewing Equipment.....	86	Five Star Chemicals & Supply, Inc.	80	Midwest Supplies	11
www.blichmannengineering.com		www.fivestarchemicals.com		www.midwestsupplies.com	
Ball and Keg	74	Gotta Brew, LLC.....	47	MoreBeer! & MoreWine!	55
www.ballandkeg.com		www.gottabrew.com		www.morebeer.com	
Ballard Chamber of Commerce/Visit Ballard.....	32	Great Western Malting Co.....	78	Muntons Malt Ingredients, Inc.	36
www.visitballard.com		www.greatwesternmalting.com		www.muntons.com	
Ballast Point Brewing & Spirits	Cover 4	Growler Chill	34	Northern Brewer, LLC.....	80
www.ballastpoint.com		www.growerchill.com		www.northernbrewer.com	
Bell's Brewery, Inc.....	18	GrowlerWerks	52	PicoBrew	65
www.bellsbeer.com		www.growlerwerks.com		www.picobrew.com	
BH Enterprises	24	Harper Collins	25	Sam Adams	7
www.TempStatControls.com		www.harpercollins.com		www.samadams.com	
Blichmann Engineering	33,35	High Gravity	79	Sierra Nevada Brewing Co.....	54
www.blichmannengineering.com		www.highgravitybrew.com		www.sierranevada.com	
BrewcraftUSA	51,53,Cover 3	Hobby Beverage Equipment Co	64	Spike Brewing	61
www.brewcraftusa.com		www.minibrew.com		www.spikebrewing.com	
Brewers Publications	76,81	Home Brewery (MO), The.....	95	Ss Brewtech	2
www.BrewersPublications.com		www.homebrewery.com		www.ssprobrew.com	
Brewers Supply Group (BSG)	56	Industrial Test Systems, Inc.	18	The Grainfather	63
www.brewerssupplygroup.com		www.sensafe.com		www.grainfather.com	
Brewlab	77	Krome Dispense Pvt. Ltd.....	21	Uinta Brewing Co.....	80
www.brewlab.co.uk/		www.kromedispense.com		www.uintabrewing.com	
Briess Malt & Ingredients Company.....	45	Lallemand	77	Visit St. Pete/Clearwater	27
www.brewingwithbriess.com		www.lallemand.com		www.visitstpeteclearwater.com	
British American Beer Company.....	17	LaMotte	79	WilliamsWarn Personal Brewery.....	25
www.britishamericanbeer.com		www.lamotte.com		www.williamswarn.com	
Castle Malting	15	Liquid Integrity, LLC	8	Wyeast Laboratories, Inc.	16
www.castlemalting.com		www.liquidintegrity.com		www.wyeastlab.com	
CMBecker International,LLC	Cover 2	Love2Brew	83	YCH HOPS.....	71
www.CMBecker.com		www.love2brew.com		www.ychhops.com	
Coldbreak Brewing.....	20	ManCan Universe, Inc.....	12		
www.coldbreakbrewing.com		www.mancan.beer			

Pink Boots Society Enables a Second Career

I'm no spring chicken. I don't have time to run off to Germany for beer school. But, I want to have a brewery. This is (kinda) how it's happening.

I've been a geologist for 35 years and a homebrewer for 12. I'd much rather be brewing, cleaning, and bottling than doing that other stuff I've been doing forever (even though the pay is pretty good). Yeah, it may sound ridiculous to switch careers and take a pay cut at this stage in my life. Folks will say, "You've missed the window of opportunity for starting a brewery!" But I know better. The reason I know is that I was fortunate enough to win a scholarship from the Pink Boots Society that allowed me to take an online course called "The Business of Craft Brewing" from Portland State University's extension service.

In case you haven't heard of it, the Pink Boots Society (PBS) is a guild-type association of women in the beer industry that supports education and training for its members and for women who want to become part of the industry. PBS arranged free tuition for the first class that ultimately led to my completing a series of courses and receiving a certificate.

I learned how to develop a business plan, how to calculate the total cost of a barrel of craft beer, how to select a proper location for a brewery, how to fund a new venture, and how to market it. The material was often difficult. I had to take the marketing class three times because I just couldn't understand the jargon or the approach. But, I stuck with it, and now I have a proper business plan, a financing plan, and a notebook full of ideas, leads, taproom sketches, and beer names.

What I still need are serious partners, a good location, and some magic—whatever leap-



of-faith magic it takes to quit my cushy job and step into the unknown, possibly treacherous world of tricky lease agreements, psychopathic building inspectors, flaky investors, biblical floods (think Houston during Hurricane Harvey), and lots of physical labor. All this just so I can pour lovely sparkling beer for happy people in my taproom. It will happen. I am sure of it.

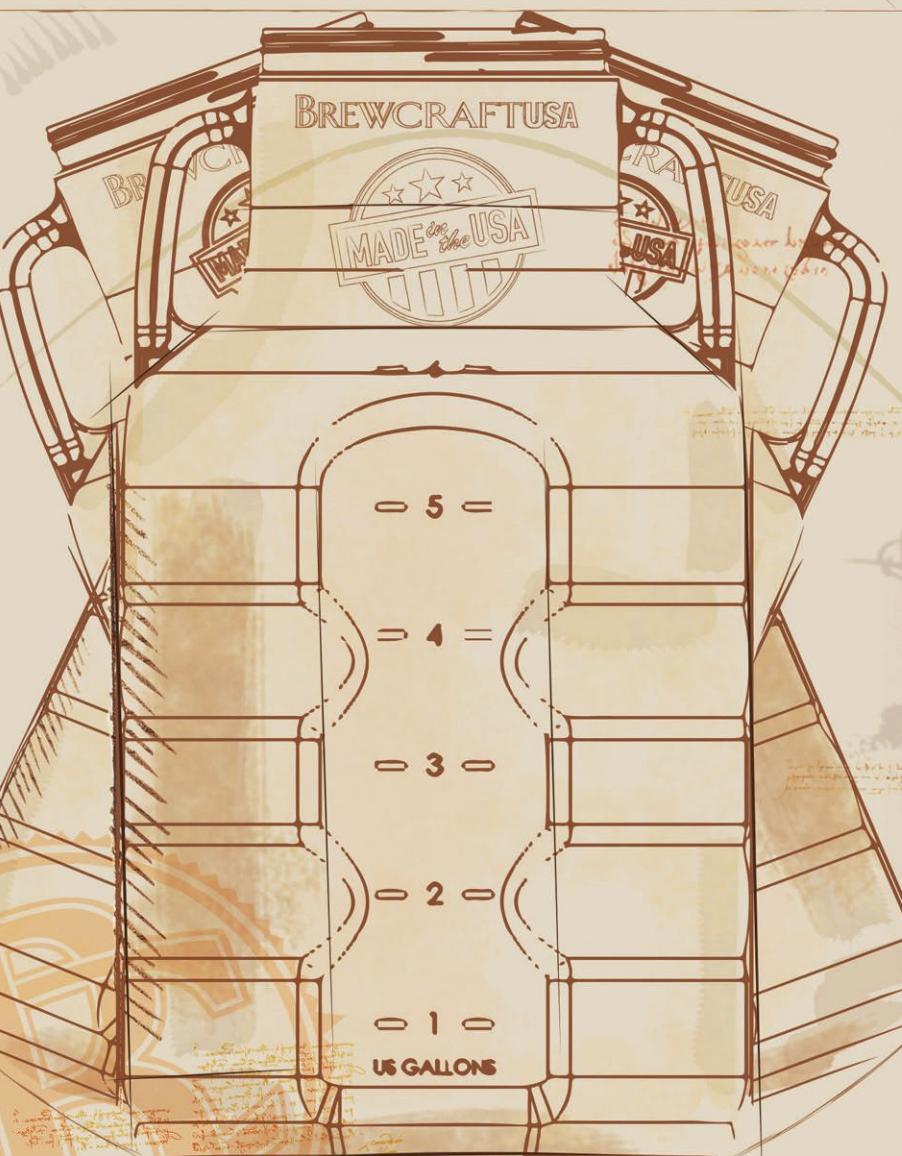
Meanwhile, I continue to interview potential brewers and partners, and I continue to scope out sites for my brewery and taproom. The knowledge I have gained from courses through Portland State's Center for Executive and Professional Education (PSU CEPE) have taught me how to run a successful craft brewery. I may not have taken those

courses had it not been for the generosity of the Pink Boots Society. Soon, everything will come together and a new quirky and quaint brewpub will come into existence, with hard-working partners breathing life into their dreams while pouring beer into pint glasses.

Great thanks to the Pink Boots Society, Emily Engdahl, Kris McDowell, and Teri Fahrendorf, as well as Mellie Pullman and the other dedicated instructors at PSU CEPE.

Janine Weber has been a homebrewer for 12 years and plans to open a brewpub in either the Houston or San Francisco Bay areas.

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