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BEST BEER IN AMERICA: A FIVE-PEAT

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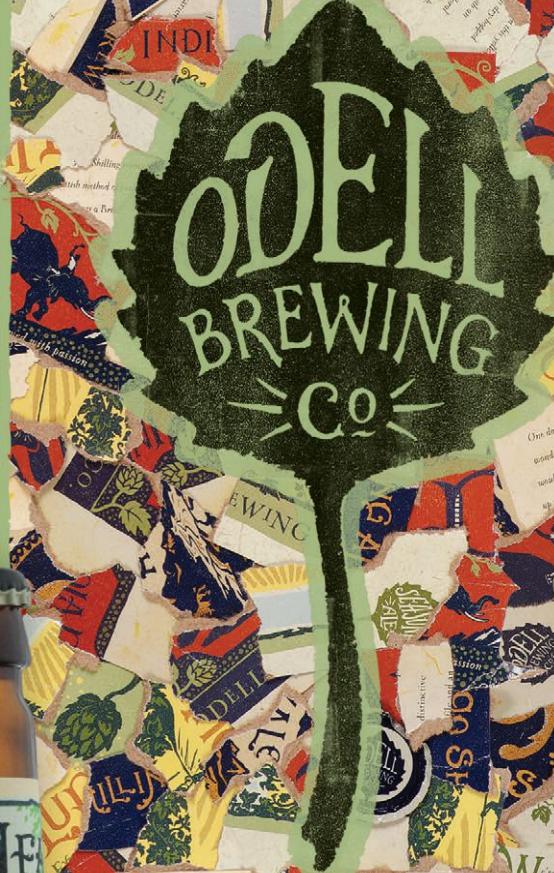
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The Reality of Going Pro

If you're thinking of starting your own brewery, you're in good company. More than 1,300 breweries in planning are currently in the Brewers Association's database.

As part of my staff duties at the Craft Brewers Conference in March in Washington, D.C., I attended many seminars in the "Start-ups" track. The conference kicked off with a general session, in which Brewers Association director Paul Gatzka set the tone for a discussion of the craft brewing industry's rapid acceleration and the race to join the party for many would-be professionals.

"If you don't care about quality first, you will fail at commercial brewing," said Gatzka.

New Belgium Brewing founder Kim Jordan, the keynote speaker, also addressed the topic of quality. "Beer drinkers are counting on us to be the guardians of quality, and what we do here matters," she emphasized.

In more than a few seminars, a general piece of advice was offered: If you're even thinking of going pro, it's important to get some hands-on work in a professional brewery, even if you have to volunteer your time to get the experience.

If you do make it to the starting line to planning your own brewery, here's a partial list of what to expect: stress and long hours; constant decision making; equipment failures; constant distractions; losing money/spending more money than planned.

And here's another partial list of things you'll need to be dealing with once you get rolling, aside from setting up your brewery and crafting your signature beers: trade-

marks; utility costs; actual cost of product; labor laws; quality control; local building regulations; access to additional capital; safety; and equipment costs. The high cost of kegs came up more than once.

In the recently released and revised *The Brewers Association's Guide to Starting Your Own Brewery*, a glance at the table of contents alone might strike fear in the hearts of would-be pros, with all of the various things that need to be addressed. In the epilogue, author Dick Cantwell of Elysian Brewing writes, "Given overwhelming precedent, the time [to open a brewery] has never been more ripe, but for that very same reason, nor has it ever been more forbidding. All the more reason to get started now, before anyone can irrevocably talk you out of it."

Of course, the lure to professional brewing is fueled by a passion for great beer, and this "Best Beers in America" issue is in part devoted to those who have gone before the current batch of breweries-in-planning, doing their time in the trenches and building their popular brands based on quality, passion, hard work, and innovation. Thanks to everyone who voted in our 11th annual readers' poll. This survey has garnered national attention, and as homebrewers and extremely knowledgeable beer lovers, your opinions are highly regarded in the craft beer world.

This issue also marks the debut of our "Style Spotlight" column, which replaces the "Club Only" column after that competition series was discontinued by the AHA. At least initially, this column, written by associate editor Amahl Turczyn Scheppach, will explore lesser-known and resurrected styles. Happy brewing!

Jill Redding is editor-in-chief of Zymurgy.



(zī'mər jē) n: the art and science of fermentation, as in brewing.

Vol. 36 * No. 4 | July/August 2013

zymurgy®

COLUMNS

2 | EDITOR'S DESK

The Reality of Going Pro

By Jill Redding



9 | FROM THE GLASS

Legal in All 50 States

By Gary Glass

67 | WORLD OF WORTS

The Americanization of Beer Styles

By Charlie Papazian

72 | LAST DROP

Ode to IPA

By Clint Cherepa

FEATURES

24 | 11th Annual Best Beers in America

The results are in! Each of the past 11 years, we've asked Zymurgy readers to vote for up to 20 of their favorite beers. A look at the results, plus clone recipes.

By Jill Redding and Amahl Turczyn Scheppach

32 | (Un)Real Ale: Cask Conditioning at Home

Cask-conditioned beer is delicious, and it is fundamentally quite simple. Fortunately, we can enjoy homebrewed real ale without subscribing to arbitrary restrictions.

By Dave Carpenter

40 | The Session IPA

What happens if we marry the hop rumble of the IPA with a pale ale- (or lower) strength beer? I would argue a wonderful thing happens—the session IPA.

By Drew Beechum

48 | Using a Refractometer

If you've been brewing a while, you may have experienced frustration using a hydrometer. A refractometer can dramatically improve your brewing and is easy to use.

By Sean Terrill

QUICK RECIPE GUIDE

| | | | |
|---------------------------------------|----|--|----|
| Admiration – Boysenberry Melomel..... | 7 | The English Session IPA..... | 43 |
| Maizey Dukes Kentucky Common..... | 20 | Bitter Beer Face Session IPA | 45 |
| Green Flash West Coast IPA..... | 28 | The Tropical Session White IPA | 45 |
| Lagunitas Brown Shugga' | 28 | Tuxedo Speedo..... | 55 |
| Spotted Charlie House Bitter..... | 35 | Magic Place India Pale Ale (All Grain) | 67 |
| The Nazz Session IPA..... | 42 | Magic Place India Pale Ale (Malt Extract)..... | 68 |

ON THE COVER: Russian River Brewing Co. owner and brewmaster Vinnie Cilurzo celebrates another victory.
PHOTO © 2013 Duncan Garrett Photography

>> GET THERE!

MILWAUKEE BREWFEST

The fourth annual Milwaukee Brewfest takes place on July 27. The festival will be held at Milwaukee's scenic lakefront at the Old Coast Guard Pavilion at McKinley Park, with a celebration of craft beer heritage for everyone to enjoy.

This year's festival offers an unlimited sampling of more than 250 craft beers from across the country. Back by popular demand, the 2013 Milwaukee Brewfest will also have a special German Row. A Cider Row has been added for festival participants to enjoy as well. Live music, food for purchase, and displays from local artists and craftsmen will also be available.

Visit www.milwaukeebrewfest.com for ticket purchases and additional information.

June 27-30

9th Annual North American Organic Brewers Festival

Portland, OR.

www.naobf.org

July 5-6

Frogs and Dogs

Issaquah, WA.

www.Rogue.com

July 5-7

Seattle International Beerfest

Seattle, WA.

Seattlebeerfest.com

July 13

Breckenridge Summer Beer Festival

Breckenridge, CO.

www.breckenridgebeerpestival.com

For more craft brewing events, go to CraftBeer.com



July 20

Naperville Ale Fest

Naperville, IL

www.napervillealefest.com

July 24-28

Oregon Brewers Festival

Portland, OR.

Oregonbrewfest.com

August 2-3

Belgium Comes to Cooperstown

Cooperstown, NY

www.ommegang.com

August 3

Brewfest Encinitas

Cardiff, CA

www.brewfestencinitas.com

August 3-4

Bones and Brew

Portland, OR

www.rogue.com

August 17

Stone Invitational Beer Festival

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>> BREW NEWS

LOCAL BEER GETS EVEN MORE LOCAL

Because No-Li Brewery in Spokane, Wash., knows source of origin matters to its loyal customer base, the brewery announced federal approval for a new style and classification of beer called "Spokane Style."

As the name suggests, Spokane Style beer must be brewed and packaged in Spokane, and all ingredients must come exclusively from the region.

"No-Li's brewing origin is the Inland Northwest, and as we like to say, it's zero miles from here!" said Damon Scott, No-Li's lead brewer. "Actually, all ingredients are from within 300 miles of the brewhouse. No-Li has etched 'local' into its core. And, as the American craft beer consumer demands source of origin, Spokane Style represents something bigger than the city itself."

Meanwhile in Hawaii, HB 1126 HD1, the "truth in labeling" bill for Hawaii beer, would require beers sold or distributed in the state whose labels convey the impression that the beers were produced in Hawaii to indicate otherwise if not actually produced in the state. The bill passed out of the committee on Economic Development and Business, but the House committee on Consumer Protection and Commerce (CPC) voted to defer the bill. The quest will undoubtedly continue for those involved.

"Consumers have a right to know," said Hawaii Rep. Angus McKelvey, who introduced the bill. "We have visitors coming here, asking for local beer. We have a whole economy based on visitors who want to support the local businesses."



>> GREAT NEW PRODUCT

WHAT'S NEW FROM GRAND CANYON BREWING COMPANY

THE FLAVOR BOMB

The Grand Canyon Brewing Company (GCB) introduced the Flavor Bomb—a patent-pending, beer-conditioning flavor widget. Craft beer lovers got their first opportunity to taste the impact last winter when GCB launched its Bomber Bottle series. Now, the same technology used to condition Shaggy Bock, Coffee Bean Stout, and Hop Bomber IPA is being made available to homebrewers throughout the country.

"The Flavor Bomb sits somewhere between the Guinness nitro widget and Stone's Enjoy By IPA series in terms of maximizing the beer drinker's experience," said Rob Fullmer, president of the Arizona Society of Homebrewers. "It changes the beer aging timeframe, and compresses the flavor sweet spot. As a brewer, I can think of dozens of different ingredients that could be added at bottling time. It's exciting."

GCB owner John Peasley explains, "With the Flavor Bomb, you can add new flavor profiles by packing it full of complementary spices, woods, and other flavorful ingredients. Its thin bullet-like design allows for easy insertion into beer bottles and its breathable holes let the flavors seep."

The Flavor Bomb is available at homebrewing stores throughout Arizona as well as online at www.theflavorbomb.com.



>> YOU'VE GOTTA DRINK THIS

SUMMIT BOHEMIAN PILSNER



Summit's Bohemian Pilsner won the silver medal at the 2012 Great American Beer Festival. Wow: after tasting it, I can see why. It is very clean and crisp with an excellent mouthfeel. It is a drinkable beer at any time of year and very satisfying. Brewmaster Mark Stutrud is very proud of this beer, for good reason! You'll find a new appreciation for this style of beer with Summit's Bohemian Pilsner.

Reviewed by David Scheil, Cedar Falls, Iowa

BEER QUOTE

*"Beer drinkers
are rooting for us.
They love our stories
and they love the energy
with which we show up."*

—New Belgium Brewing founder
Kim Jordan, referring to the
craft brewing industry



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>> PROFESSIONAL MEADMAKER PROFILE:

MICHAEL FAIRBROTHER

BY GORDON STRONG

I've long thought that the best homemade meads taste better than the finest commercial meads, mostly since home producers can pull out all the stops and don't have to worry about making money. But I think I need to retire this line of thinking now that I've tried some of the new breed of commercial meads typified by Moonlight Meadery of Londonderry, N.H. I caught up with Michael Fairbrother, owner and meadmaker, and his wife Berniece Van Der Berg, to find out why.

Fairbrother was an award-winning homebrewer and meadmaker before turning pro in 2010, starting in his garage. In three short years, he's moved to a commercial site and grown the business to selling more than 20,000 cases a year in 30 states (and counting). He recently added two 1,000-gallon fermenters to supplement the 500-gallon ones he'd been using—quite a far cry from 5 gallons at a time.

I asked Michael why he thinks he's seen such growth. He said that "people said we couldn't make premium mead the way we do, but I ignored them" and that he's "making mead the same way as at home, but just on a larger scale." With more than 60 different varieties of mead, he's ignoring conventional wisdom and delivering an ever-increasing range of creative products.

Fairbrother chooses his ingredients with care, selecting honey varieties, fruit, and spices for their flavor and aroma, not price. His typical recipes are 75 percent water and 25 percent honey, made with untreated local New Hampshire water. He uses the Lalvin 71B-1122 (Narbonne) wine yeast exclusively. He only heats the honey to 80° F (27° C) so it can be pumped, but does not heat or boil the must.

Honey and water are combined in a special mixing tank, fruit puree is added if making melomels, and the meads are fermented slowly at 62° F (17° C). Staggered nutrient additions (the "Ken Schramm method") are used. Michael says that

"slower fermentation means cleaner flavor," so meads ferment and condition for at least three months, sometimes longer. Special batches are barrel aged. Michael was particularly proud of batch #5 of his Utopian mead, a 19-percent ABV orange blossom mead aged in Samuel Adams Utopias barrels for 18 months.

Fairbrother favors commercial fruit purees in his melomels since they are widely available, easy to use, and guaranteed to be sanitary. I tried his Desire mead (their best seller), which uses black currants, blueberries, and black cherries. It has a big fruit character with lots of tannin, but each of the fruits was distinctive.

Other favorites from my visit were Seduction, a coffee, chocolate, and vanilla metheglin (spiced mead), which uses cold-steeped coffee, cocoa nibs, and Madagascar bourbon vanilla; and Breathless, a sweet-and-hot cinnamon metheglin that reminded me of red hot dollar candies. I tried 16 meads that day, and felt like I was only scratching the surface.

I understand why Michael's meads are just as good as the best homemade meads—he's making them the same way, without



any compromises. But he's successful because he comes up with great flavor combinations and has an unrivaled passion for what he's doing.

Just do me a favor, Michael—leave some honey for the rest of us!

Three-time Ninkasi winner Gordon Strong is president of the Beer Judge Certification Program and author of *Brewing Better Beer*.

Admiration – Boysenberry Melomel

Recipe provided by Moonlight Meadery (www.MoonlightMeadery.com)

INGREDIENTS

for 5 U.S. gallons (19 liters)

| | |
|---------------------|--|
| 20.0 lb | (9.1 kg) wildflower honey |
| 8.0 lb | (3.6 kg) boysenberry puree |
| 2.6 gallons | (9.8 L) water |
| 2-3 packages | L71-B yeast |
| 3 tsp | Yeast Energizer/Nutrient blend (equal parts Fermaid-K and Go-Ferm) |

DIRECTIONS

Stir (whip) together honey and water to thoroughly mix, and to introduce oxygen. Do not boil. Add fruit puree and blend well. Rehydrate yeast prior to pitching, follow staggered yeast nutrient regime (divide nutrients into four equal portions, adding one portion per day starting with pitching). Ferment in the low 60s (16-18° C), target 62° F (17° C). Sweet mead, still.

Original Gravity: 1.154

Final Gravity: 1.030 to 1.040

Author's note: This recipe is a good template for any melomel. Feel free to substitute the fruit to your tastes. Canned purees designed for brewing or winemaking are suitable.



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By Gary Glass



Homebrewing: Legal in All 50 States!

In the wake of the March passage of legislation legalizing homebrewing in Mississippi, Alabama followed suit by passing its own homebrew legalization bill. Alabama Gov. Robert Bentley signed the bill on May 9, making Alabama the last state in the union to legalize homebrewing. While Alabama was the final state to pass a homebrew legalization bill, that bill went into effect immediately upon being signed by the governor; the Mississippi bill does not go into effect until July 1, 2013.

Congratulations to Alabama's Right To Brew coalition that has worked toward this day for the past five years. Cheers to all of the many homebrewers who played a role in the passage of the homebrew bill. I'd particularly like to offer a toast to Brant Warren, Rich Edmondson, John Little, Scott Oberman, John Sharp, and John Tipton, who were instrumental in making homebrew legalization a reality. It's been a grueling battle to change this law, but Alabama's homebrewers stuck with it despite many setbacks and can now celebrate with a much deserved and legal homebrew!

Other Homebrew Legislation

In Georgia, existing law limited homebrewers to production of no more than 50 gallons of beer per year, none of which could be consumed outside of the household where it was made. On May 6, Gov. Nathan Deal signed HB99, increasing the annual production limit to equal that of federal law, though with a stipulation that no more than 50 gallons be produced in a 90-day period. The bill also allows for removal of up to 25 gallons of homebrew for events that have a new special homebrew event permit. While more restrictive than bills recently



Members of the Rocket City Brewers celebrate the legalization of homebrewing at Straight to Ale brewery in Huntsville, Ala.

passed in other states, this bill represents a step in the right direction.

On April 10, Iowa Gov. Terry Branstad signed HF488, eliminating an existing restriction that homebrew could only be consumed in a "private home." The new law allows removal of homebrew from the home for personal use. (The federal homebrew statute includes organized affairs, tastings, and competitions as examples of personal use. The Iowa Alcoholic Beverage Division may or may not interpret personal use in the same way.)

In Missouri, Senate Bill 121, which among other things allows for homebrew to be removed from the home for uses consistent with federal law, such as competitions and club meetings as well as beer festivals, was passed by the Missouri legislature on

May 17. Dan Kopman, co-founder of The Saint Louis Brewery, was instrumental in getting this bill filed.

The Illinois legislature passed homebrew bill HB 630 in May. The new law will allow for homebrew to be transported for club meetings, competitions, and other events, as well as allowing homebrew supply shops to offer samples of homebrew to their customers. The bill does allow for homebrewers to brew at locations other than their homes, but requires that fermentation take place either at a residence or at a homebrew supply shop.

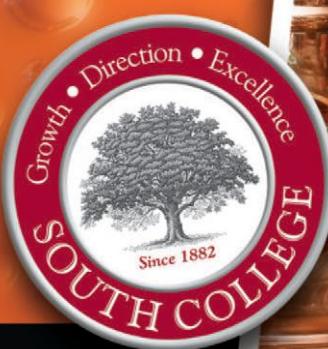
A Kansas bill to allow homebrew to be transported for club meetings and competitions died after being passed by the House Committee on Federal and State Affairs.

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Big Brew

On May 4, 8,500 homebrewers brewed 17,000 gallons of homebrew at 383 sites (a new record) in 13 countries (tied for the record) for the 16th annual Big Brew. Thanks to everyone who participated in this worldwide celebration of our beloved hobby!

I was fortunate enough to spend Big Brew with more than 1,000 fellow homebrewers at the Southern California Homebrewers Festival (SCHF) where I gave a presentation on the state of the hobby (more fun than a State of the Union address). The organizers of the SCHF really do a great job with this event. There were 40 homebrew clubs with booths serving up homebrew to attendees, up from 33 the previous year. The event is held at a lakeside campground north of Los Angeles. In addition to the homebrew, there was plenty of food, live music, and sunshine. Membership to the California Homebrewers Association is a requirement for attendance.

AHA Governing Committee Election

Congratulations to Fred Bonjour and Justin Crossley on winning re-election to the AHA Governing Committee. The current committee term started June 1. Thanks to all of the candidates who ran for the Governing Committee—I truly appreciate their dedication to the AHA and the AHA membership. Thanks also to all of the members who voted in this year's election.

Research & Education Fund

If you've ever wondered what the Governing Committee does to contribute to your association, here's a perfect example: in April, the AHA launched the new Research and Education Fund (R&EF). Last year, the AHA Governing Committee members came up with the idea of funding homebrew-related research projects conceived and executed by members of the American Homebrewers Association, with results to be published in *Zymurgy*, on *HomebrewersAssociation.org*, and/or presented at the AHA National Homebrewers Conference. Now we are very happy to make this great idea a reality.

Several applications have already been

submitted for the AHA Governing Committee's Research and Education Fund subcommittee to review. For more information, or to submit a proposal, look for the Scholarship & Grants section of HomebrewersAssociation.org under the Community drop down navigation.

Club News

With the conclusion of the May 2013 Club-Only Competition, the American Homebrewers Association (AHA) will discontinue the Club-Only Competition program. Having achieved many of its original objectives for the program, the AHA will redirect resources to some exciting new activities.

One of the main purposes of the Club-Only Competitions when the program was launched was to provide an easy-to-run competition to help educate homebrew clubs on the process of successfully executing homebrew competitions. The rapid growth of the hobby over the last several years has included a dramatic increase in the number of homebrew clubs across the country, which translated into a rapid growth in the number of entries being submitted to the Club-Only Competitions. With competitions starting to exceed 100 entries, it was apparent that the competitions could quickly become too large for first-time host clubs to handle. Rather than wait until we had a situation where a volunteer club simply couldn't handle the number of entries submitted, we decided to re-allocate resources for clubs into other areas.

Clubs can continue to access education on beer styles via the new Style Spotlight department in Zymurgy magazine debuting in this issue. At least initially, the Style Spotlight, written by associate editor Amahl Turczyn Scheppach (who also wrote the Club Only columns), will focus on lesser known and resurrected styles in the United States, such as Kentucky Common (see page 19). We also encourage clubs to submit recipes to Zymurgy, as well as suggest styles that they'd like to see covered in the Style Spotlight (email zymurgy@brewersassociation.org).

In addition, the AHA is launching a new annual award, the Radegast Club of the

Year Award, focusing on club education and community service activities. (Radegast is a Slavic god credited with inventing beer.) This new award is another example of a Governing Committee brainchild come to fruition. See the Clubs section under Community on HomebrewersAssociation.org for details on this new award, along with a form for submitting club entries into the contest.

The Radegast Club of the Year Award will help the AHA draw attention to the many activities that homebrew clubs are involved with that benefit their communi-

ties, helping to elevate the image of homebrewing and promote the hobby. Club submissions will also allow the AHA to provide additional educational resources, enabling clubs to learn about the successful activities of other clubs around the country. The first Radegast Club of the Year Award will be announced at the 2014 National Homebrewers Conference in Grand Rapids, Mich.

Until next time, happy homebrewing!

Gary Glass is director of the American Homebrewers Association.

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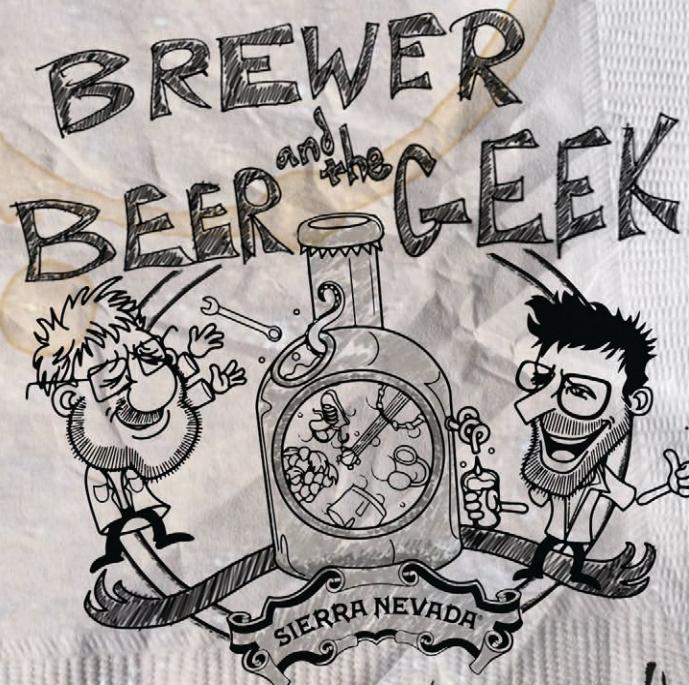
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Homebrew Shipping Woes

Dear Zymurgy,

As many homebrewers have done, I shipped my homebrews for the National Homebrew Competition via UPS since I don't live close to a judging center. As much fun as a 13-hour road trip to Kansas City, Mo. sounds, I have a day job so shipping is my only option (other option is to not compete at all).

I like to believe I am a man of high morals and values and I hate blatant lying, but this is what I'm forced to do every time I ship beer for competitions. This year I thought "no more lies" and went to UPS and told them exactly what was in the package, only to be sent to a main distribution site because they can't handle shipping of alcohol at a small store. Hopeful, I headed to the main site. At the main distribution site, I stated what was in the package and where it was going. "We can't ship that, I need to call a manager," I was told. Ultimately, UPS turned me away completely, stating their tariff doesn't allow the shipment of beer even for judging/analysis.

Frustrated, I went to a different UPS store and told them I'm shipping "yeast samples packed in glass bottles." Package went through without a problem. Well, except for the fact that I feel like some sort of criminal bootlegger.

The homebrew competition website says:

It is not against any Bureau of Alcohol, Tobacco and Firearms (ATF) regulations or federal laws to ship your entries via privately owned shipping company for analytical purposes. ... Private shipping companies have the right to refuse your shipment if they are informed that the package contains glass and/or alcoholic beverages. ... It is solely the entrant's responsibility to follow all applicable laws and regulations.

Here's the only line in UPS's tariff on beer:

Carrier will provide transportation services for alcoholic beverages (including beer, wine and spirits) only to licensed business entities when both the shipper and recipient are licensed distributors, licensed wholesalers, licensed dealers, licensed manufacturers or licensed importers, and then subject to all applicable laws and regulations.

FedEx isn't any better.

To be a rule follower means to never enter a homebrew competition out of driving distance, not to mention never being able to swap homebrews with friends from out of state. Given the popularity of homebrewing and competitions, I think it's time for a change. I would like to be able to walk into a shipping business (UPS, FedEx, even USPS) and proudly say "I am shipping homebrew" instead of skirting or bending the truth.

How can we as 36,000+ registered AHA members make this happen? Look at how fast the national competition filled up this

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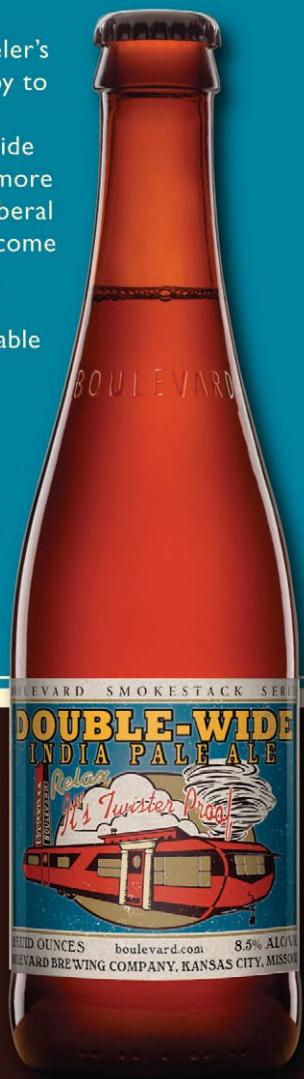
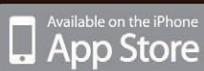
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year. I don't see the popularity wavering anytime soon.

Thanks for reading,

Mark Wilk
Cedar Springs, Mich.

AHA director Gary Glass responds: The current situation for shipping homebrew is less than ideal. It is a complicated issue, since every state has its own laws regarding shipment of alcohol. However, as an AHA member you are helping the cause, as your member dollars are helping the AHA's ongoing work to rectify the situation. Hopefully we will see progress on this front soon.

Keep Them Doggies Rollin'

Dear Zymurgy,

As beer lovers and dog lovers, we are happy to see the many canine brew companions that you have chosen to share in your magazine.



We'd like to introduce your readers to one more—our brew dog Lily (a rescued Manchester Terrier mix.) This brew companion is not as interested in the final product as she is the by-product: HEAT. There's a stainless steel mash tun under there, honest!

It takes all kinds,
Shawn Wischoeffe and Al Lewandowski
Aurora, Ill.

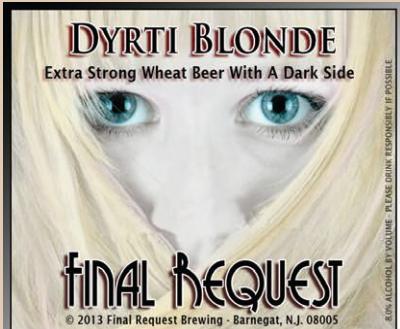
Dear Zymurgy,

Besides reading all of the great articles in Zymurgy, I love getting a good chuckle from the pictures of the loyal brew dogs and cats that always help to make our brew days just a little more fun. This is Spike, one of the most important members of my brew team. He is a three-year-old American bulldog/Shar-Pei mix. After



FROM OUR READERS

More homebrew labels from Zymurgy reader Mark Lubeski.



a hard day of lapping up spilled wort from the brewery floor, he loves to chill at the kitchen table and help with a hand or two of poker.

Cheers,
Michael Figueira
Sahuarita, Ariz.

Concerns About Plastic

Dear Zymurgy,
I am a fairly recent member, although I have been homebrewing for about 16 years, the last nine of which have been

all-grain. I love the mag, but here's my concern. I see a lot of homebrewers using plastic components in their brewing, particularly when mashing in coolers or ice chests (for example, see page 7 of March/April 2013 Zymurgy).

I understand the value of these components, because they have insulating properties that keep the mash at a fairly stable temperature. However, I encourage brewers to research the possible side effects associated with heating some types of plastics and then consuming edibles

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out of them. I also encourage those brewers to take a hard look at who might be funding any given study. Happy brewing.

Cheers!
John in Colorado

Send your Dear Zymurgy letters to zymurgy@brewersassociation.org. Letters may be edited for length and/or clarity. Hey homebrewers! If you have a homebrew label that you would like to see in our magazine, send it to art director Allison Seymour at allison@brewersassociation.org.



FROM OUR READERS

Bottom-Side-Up Brewing Co. homebrewer Heath Gelinas, along with his brother Jason and sister-in-law Stacey, created these labels for some of the batches of beer they brew together.



by Professor Surfeit



Yeast Dispensers in the Biergarten

Dear Professor,
I'm an avid Norwegian homebrewer and the proud owner of two of Charlie Papazian's books (*The Complete Joy of Homebrewing* and *Microbrewed Adventures*). Both of these books have provided me with ample guidance and inspiration, so thank you to Papazian!

Recently I discussed beer with my brother. At some point during the discussion, I remembered reading from *Microbrewed Adventures* (chapter Hopfweissbier Brauerei) that in some biergartens they have yeast dispensers available for their customers. I mentioned this to my brother. He refused to believe it, and very soon we had ourselves a money bet.

I thought this was going to be easy money, but after one hour of searching, Google gave me nothing to substantiate my claim. To make matters worse, I wrote an email to a friend of mine living



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in Munich, and she claimed that she had never heard of such a thing.

So I decided to make one last effort before paying my brother. Do you know if there are still yeast dispensers hanging around on some biergartens? Is there any written evidence to back it up (other than the book)?

The bet is not a big one, but I am supposed to be the beer guru in our family. Thanks in advance for your kind reply.

Best regards,
Stian Mong

Dear Stian,
Charlie Papazian still recollects the yeast dispensers in the biergarten. They were similar to, if not the same as, the hand pump mustard dispensers for the pretzels they were serving at the same time. Though yeast dispensers may not be in fashion in 2013, they certainly were around in the area of Miesbach in 1987. It sure is easy enough to arrange, but be sure you don't seal the container, or at least have a pressure release mechanism—just in case the yeasts decide to metabolize something.

Dispensing historical information,
The Professor, Hb.D.

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The Origins of Lager Yeast

Dear Professor,

In regards to the letter from Nick Jones in the March/April 2013 Zymurgy, lager yeast has origins in Patagonia in South America. Mark Johnston of my department was involved in a study that showed that the DNA from lager yeast points to a Patagonian origin. Because it is cold there, the yeast have adapted. What is not known is how they got to the caves in Bavaria. One guess is that they came across on a Portuguese or Spanish ship

during the 16th century. (See a 2011 USA Today article called "We Have Columbus to Thank for Lager Beer.")

Here's the scientific reference: Libkind, D., et al. 2011. "Microbe domestication and the identification of the wild genetic stock of lager-brewing yeast." Proceedings of the National Academy of Sciences of the USA 108:14539-44.

Robert A. Sclafani

Professor of Biochemistry and Molecular

Genetics Program Director of Cell Biology

in the Cancer Center

University of Colorado School of Medicine
Aurora, Colo.



Dear Professor Sclafani,

I remember that article. What is interesting to consider is whether lager yeast migrated to Europe before the Spanish or Portuguese accidentally harbored lager yeast stowaways. It seems that somewhere there would be a pre-Columbian European beer vessel that could be tested to see whether there was lager yeast before the New World was discovered.

I can only imagine that lagers were cool fermented and cold aged in caves and with ice blocks way before Europe was infected with lager yeast from Patagonia.

I wonder why the discovery of original DNA from lager yeast in Patagonia should exclude the possibility that this DNA could have also emerged in a cooler environment on a cooler part of the Euro-Asia land mass. It seems possible, doesn't it?

Regardless, this whole origin of beer species remains fascinating to us beer geeks.

I'm glad my title isn't as long as yours. Wow. That's quite the lineup; I mean to say you have a line up on me.

From one professor to another,
The Professor, Hb.D.

Hey homebrewers! If you have a brewing-related question for Professor Surfeit, e-mail professor@brewersassociation.org.

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By Amahl Turczyn Scheppach

Kentucky Common Beer

The new Style Spotlight department will, at least initially, focus on lesser-known, obscure, or forgotten beer styles, few of which currently enjoy commercial popularity even among craft brewers. Many of them began as regional specialties brewed to satisfy fairly specific local tastes, and came about because of available ingredients, brewing conditions, demand, process, or a combination of all these things. The United States, while now recognized as one of the greatest brewing nations in the world, boasts a relatively short list of truly indigenous styles.

The obvious reason for this is our legacy of Prohibition. Before that noble experiment, local breweries thrived, and immigrant brewers from Old World brewing nations were adapting the traditional beer styles of their homeland to their New World surroundings. When these experimental beers gained a following, even locally, their brewers could lay claim to creating uniquely American beer styles. In many respects, their efforts were the very roots of the American craft brewing movement.

Outside of Colonial-era brews, some of which this column will address in the future, there are only a handful of uniquely American beers. Some of the more obscure among them include American stock ale and Pennsylvania Swankey, but a couple became popular enough to stand out. They were both referred to as "common beer," which at the time usually indicated a beer of light or dark color with low alcohol and high carbonation. California Common, or "steam beer," a term later trademarked by Anchor Brewing Company, began in the Bay Area around San Francisco, Calif. Kentucky Common (sometimes also referred to as "cream ale" or "dark cream ale") grew up near Louisville, Ky.

Much like their names, the two had much in common. Both were amber to brown beers colored with caramel and a bit of black malt; both usually had a proportion of sugar adjunct or corn grits, often up to 33 percent of the total fermentables. Both were alternatives to the popular lager styles, which in those

pre-refrigeration days required prohibitively expensive amounts of ice to ferment properly. Because common beer was fermented at ambient temperatures (though California Common still used a lager yeast), they were much cheaper to produce. They didn't keep well, and could not be transported great distances, which added to their local appeal. They were also intended to be consumed fresh, and were often kegged before fermentation was complete, so both products built up considerable "steam" before the kegs were tapped and consumed.



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INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

| | |
|----------------|---|
| 5.0 lb | (2.27 kg) two-row pale malt |
| 1.5 lb | (680 g) flaked maize |
| 12.0 oz | (340 g) six-row pale malt |
| 12.0 oz | (340 g) dark (275 L) candi sugar (boil) |
| 8.0 oz | (227 g) rye malt |
| 8.0 oz | (227 g) acidulated malt |
| 3.0 oz | (85 g) Carafa malt (525 L) |
| 1.0 oz | (28 g) molasses (boil) |
| 0.25 oz | (7 g) Magnum, 12% a.a (60 min) |
| 1.0 oz | (28 g) Tettnanger, 4.5% a.a (20 min) |
| | California ale yeast |
| | Lactobacillus pure culture (if using a sour mash) |

Original Gravity: 1.048

Finishing Gravity: 1.00-1.012

IBUs: 22

SRM: 24

ABV: 4-5%

Boil Time: 60 minutes

DIRECTIONS

If you are using a sour mash starter, start it one to three days before you plan to brew the main batch. Use 1.85 lb (839 g) of the total 5 lb (2.27 kg) of pale malt, the acidulated malt and the Lacto culture for the sour mash. For the main mash, use the remaining 3.15 lb (1.43 kg) of pale malt, the six-row, flaked maize, rye malt, and Carafa. (**Note:** If you are not doing a sour mash starter, you can substitute 1 lb acidulated malt for 1 lb (453 g) of the pale base malt, for a total of 1.5 lb (680 g) acid malt—add this after

mashing the other grains for at least 30 minutes. The acid malt will add a mild acidity to the finished beer, which may be somewhat one-dimensional, but will spare you the trouble of conducting a sour mash.)

Mash grains at 151° F (66° C) for one hour. Raise mash temp to 158° F (70° C) for 20 minutes (or add your heated mini-mash if you've done one to bring it up to temperature). Then mash out at 168° F (76° C) for 10 minutes. Add candi sugar and molasses prior to boiling, dissolving thoroughly. After the boil, chill wort to 68° F (20° C), aerate, and pitch. Ferment at 68° F until terminal gravity, then chill to 40-50° F (4-10° C) and cold condition for one to two weeks before packaging. Steam- or bourbon-sanitized dark-char wood chips can be added during cold conditioning for a bit of extra character. Harsh or roasty grain notes and yeast character should mellow during this time, and tartness will marry with residual malt sugars. Serve cool and highly carbonated.

Extract Version: Substitute 3.6 lb (1.63 kg) pale malt extract syrup for the 5 lb (2.27) pale two-row malt (or 2 lb/0.9 kg) extract for 3.15 lb (1.43 kg) pale two-row if you've done a sour mash starter). Conduct a mini-mash on brew day (separate from the sour mash, if you've used one) with the six-row, flaked maize, Carafa malt, and rye malt. Mash at 151° F (66° C) for 30 minutes. If acid malt is being used in place of the sour mash, add it now. Mash for an additional 20 minutes at 158° F (70° C). Drain and rinse grains (of mini-mash and sour mash, if using). Dissolve extract and proceed with boil.

procedure for producing Kentucky bourbon, so a similar sour mash of around 70 percent pale malt, corn, sugar, rye, and either brewer's caramel or black malt for color was used to produce a light to medium strength brown beer of 4 to 5 percent ABV. Unlike California Common, which by most accounts was heavily hopped, the Kentucky variety had only a modest bitterness of 20 or 30 IBUs, so the lactic acid present helped balance the malt sweetness and add complexity. Perhaps not surprisingly, sour beer was big in Louisville, and common wasn't the only style; a stronger variation of Berliner weisse was also brewed locally, with less wheat in the grain bill, but with the same sharp tartness, fierce carbonation, and cloudy appearance of the original.

All About Balance

Sour mashing in mind, it's time to start crafting a recipe. Kentucky Common is all about balance, and lactic acid plays a big part, but sourness doesn't have to dominate. In fact, you can brew the beer without the sour mash if the prospect is too daunting; a quick dose of brewer's lactic acid in secondary will provide a balancing acidity, though you won't get the bready, sourdough complexity. Even without this, a bit of extra acid malt in the mash will provide a small amount of acidity on its own, without the need for sour mashing, though the end result won't be nearly as sour or complex (see Note in recipe Directions).

Kentucky Common is meant to be a light and refreshing, easy-drinking brown ale with some corn sweetness offset by a fruity background tartness and some sourdough complexity, so if simplicity is your thing, you can avoid the sour mash and still do the style justice. A bit of rye malt will add a spicy nuance; dark candi sugar and just a touch of molasses will add a cookie-like brown sugar note and keep things dry in the finish; and some Carafa malt will darken the color without getting things overly roasty. But if you want to go the extra mile and are willing to dive into sour mashing, you can really nail the true Kentucky Common—sour mashing can produce a very smooth, complex, light-bodied dark ale, somewhere in the territory of an American Flanders brown or

Brewers recognized the potential of selling these inexpensive beers at a lower price than competing brands, so they soon enjoyed a huge following, mainly among the working class. One source estimates that in 1913, 80 percent of the beer consumed in Louisville was Kentucky Common—so while it never had the far-reaching impact that California Common beer had, with Fritz Maytag making it and craft brewing popular for present day generations of beer enthusiasts, Kentucky Common deserves a place

in American brewing history as one of the few uniquely American beer styles.

The similarities between Kentucky Common and California Common end there, however. The Louisville area was and is known for bourbon production, and this had a huge influence on the origins of the local beer. Distillery labor is hot, thirsty work, after all, and workers needed something light to refresh them. Sour mashing of malted six-row barley with corn grits and rye was standard

oud bruin. Sources indicate that acid levels are not supposed to be as high as they are with Berliner weisse, or even Flemish sours; here, they merely brighten up the corn and malt sweetness and provide a pleasant but gentle tang at the finish.

Those who have already tried sour mashing at home know that it can be somewhat of a gamble. Leaving your mash to sit at 115° F (46° C) for two or three days may be just the thing for a noticeable dose of clean lactic acid, but it may also end up encouraging Acetobacter and Clostridium, leaving your precious beer smelling more like acetic acid (vinegar) or butyric acid (sweaty socks and vomit), respectively.

To give yourself better odds, you may want to use a pure-cultured lactobacillus bacteria strain like White Labs WLP677 or Wyeast 5335 in your sour mash. Begin the starter mash two or three days before brew day, depending upon how long you want to conduct the sour mash, and how much acidity you want in your Kentucky Common. Use up to 20 percent of your total grain bill in two-row pale malt for the sour mash. For example, if your total grain bill is 9.25 lb (4.2 kg), as in the recipe, figure on sour-mashing 1.85 lb of the 5 lb (2.27 kg) total pale two-row malt called for in the recipe. Mash this in at 151° F (66° C) and hold it at this temperature for an hour. When conversion is complete, let it cool to about 130° F (54° C). Your starter mash pH should now be in the neighborhood of 5.3.

Many sour mash recipes say you can just add crushed two-row at this point because it naturally contains desirable lactic acid-producing bacteria, namely *L. delbrueckii*. This is true, but during the time it takes those bacteria to grow and begin producing lactic acid, there's a chance other, less-desirable bacteria like the ones mentioned above are growing too. If you could just get your pH down to 4.3 before adding the pure culture bacteria, you'd have a better chance of a "clean" sour mash. That's where acid malt comes in. This is Pilsner malt that has been soaked (Weyermann) or sprayed (Best Malz) with a lactic acid solution and then dried. It doesn't necessarily contain living lactic acid-producing bacteria, as a pure lactic

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culture would; rather, it contains the acid itself, in dried form.

The goal here is to add enough crushed acid malt to get your sour mash down to the "safe" pH of 4.3 so that the living bacteria can work in a sufficiently acidic environment to exclude other, less acid-tolerant bacteria. According to the acid malt producers, 10 percent of the mash volume should lower the pH by 1.0; for our 30 dry ounce (850 g) starter mash, that's 3 ounces. However, I've found that it often takes a bit more to lower the pH to 4.3—up to 8 ounces. I like to have a pound or so of acid malt on hand just in case. And by the way, a good pH meter really comes in handy here.

Adding Bacteria

When you've hit your pH, gently stir in the pure culture. Try to minimize oxygen in the starter (the anaerobic *delbrueckii* doesn't need it, and *acetobacter* does). Keep in mind that there are starches in the acid malt itself that will now have trouble converting, since not only are you out of the ideal temperature range for amylase activity, the low pH will also interfere with saccharification. But a little turbidity at this point is OK—your main purpose from here on out is to grow bacteria. Allow the mini-mash temperature to equalize at 115° F (46° C): bacteria-friendly temperature. The closer you can hold it at this temperature the better, but don't let it get over 120° F (49° C). Depending upon how much acidity you want, you can keep your mini sour mash at 115° F (46° C) for one to three days. You can monitor its progress by tasting and smelling along the way, to make sure nothing foul has developed. With the above precautions, nothing should have; but if it has, at least you are not risking a full batch. Another advantage here is that no bacteria will infect your cold-side equipment (fermenters, transfer lines), since they'll all be boiled in the kettle: critters die, acid remains.

Depending on your preference, you can let the mini-mash get pretty sour, since you will be blending it into your main mash at a 1 to 4 ratio; the blended mash volume won't be nearly as sour as your sour starter mash. A 24-hour starter mash

will lend just a hint of sourness to your finished beer, no more than a pleasant tang. Two days will give a more pronounced sourness with a pleasing sourdough flavor; this is recommended. Three days will develop substantial acidity in your sour mash, but often with a harsher, funkier flavor. This will give a bolder tartness to your Kentucky Common—not as sour as a Berliner weisse, but probably on the higher end for a Common.

On brew day, mash in your main batch for a fairly fermentable wort (151° F/66° C for 60 minutes) as usual. The extra enzymes in the six-row will help with the conversion of the flaked maize. You will probably want to heat up your mini-mash to somewhere between conversion temperature (151° F/66° C) and boiling before adding it to the main mash. This will eliminate the live bacteria and boost the temperature of your main mash in preparation for your sparge. After main mash conversion is complete, blend in your heated sour mash starter. Remember that once the starter is added, it will lower the total mash pH; if it drops much below 5.2, enzymatic activity will be affected, so this won't be a normal step mash; but depending upon how much acid is in your sour starter, it may be worth holding the main mash for 10 or 15 minutes before sparging—you may get some further enzymatic activity.

You'll want a fairly clean ale yeast that's a good attenuator—good old California ale yeast is a good choice. Extended cold conditioning also really helps this beer. For a more bourbon-like character, you can add a few dark-charred, sanitized oak chips to secondary or in the keg...but err on the light side for quantity, as you don't want the beer overly woody. Everything should blend together into one multi-faceted, easy-drinking whole. This is a beer that's so complex and yet so thirst quenching that it's hard to have just one.

Now that you have the method, let's put grist to water and brew this thing.

Amahl Turczyn Scheppach is the associate editor for *Zymurgy*. He is a former professional brewer who now brews at home in Lafayette, Colo.

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Cheers to Russian River Brewing Co.
for brewing the Best Beer in America,
as chosen by AHA members.

The Results Are In!
11th Annual Survey: Zymurgy's

Best Beers in America

By Jill Redding

I caught up with Russian River's Vinnie Cilurzo at the Craft Brewers Conference in Washington, D.C. in March, not long after voting for the 11th annual Zymurgy Best Beers in America poll had ended.

"So Vinnie," I began. "We're calculating results from the Best Beers in America survey, and one thing is already pretty obvious..."

"Oh man," he said, laughing. "Did it win again?"

Yes, Vinnie. It did.

For the fifth straight year, Russian River's Pliny the Elder, a double IPA, is the gold standard for the best beers commercially available in the United States, as chosen by members of the American Homebrewers Association, who could vote for up to 20 of their favorite beers in an online poll. Once again, it bested Bell's Two Hearted Ale for the top spot.



TOP-RANKED BEERS

(T indicates tie)

1. Russian River Pliny the Elder
2. Bell's Two Hearted Ale
3. Dogfish Head 90 Minute IPA
4. Bell's Hopslam Ale
5. Ballast Point Sculpin IPA
6. Founders Breakfast Stout
7. Arrogant Bastard Ale
8. Sierra Nevada Ruthless Rye IPA
- T9. Lagunitas Sucks
- T9. Sierra Nevada Celebration Ale
- T9. Stone Ruination IPA
- T12. North Coast Old Rasputin
- T12. Sierra Nevada Torpedo Extra IPA
- T12. Stone Enjoy By IPA
15. Sierra Nevada Pale Ale
16. The Alchemist Heady Topper



- T17. Firestone Walker Double Jack
- T17. Founders Kentucky Breakfast Stout
19. Oskar Blues Dale's Pale Ale
20. Firestone Walker Wookey Jack
- T21. Bear Republic Racer 5 IPA
- T21. Three Floyds Zombie Dust
- T23. Firestone Walker Union Jack
- T23. Lagunitas Little Sumpin' Sumpin'
25. Goose Island Bourbon County Stout
26. Surly Furious
- T27. Deschutes Black Butte Porter
- T27. Green Flash West Coast IPA
- T27. Tröegs Nugget Nectar
30. Dogfish Head 60 Minute IPA
31. Russian River Consecration
- T32. Boulevard Tank 7 Farmhouse Ale
- T32. New Belgium La Folie
- T32. Russian River Supplication
35. Avery The Maharaja
36. Lagunitas IPA
37. Stone IPA
38. Odell IPA
- T39. Great Lakes Edmund Fitzgerald
- T39. Left Hand Milk Stout
- T39. Russian River Pliny the Younger
- T42. Odell Myrcenary
- T42. Russian River Blind Pig I.P.A.
- T42. Stone Sublimely Self-Righteous Ale
45. Firestone Walker Parabola
- T46. Ommegang Hennepin Saison Ale
- T46. Left Hand Milk Stout Nitro
- T48. Ommegang Three Philosophers
- T48. Deschutes The Abyss
- T48. Green Flash Palate Wrecker
- T48. Lagunitas Brown Shugga'

"Getting the homebrewers' vote is important, because that's how I started," said Cilurzo. "They make beer, they're brewers, they know what good is. It's incredibly flattering that homebrewers love the beer like that."

For a beer that isn't widely distributed—Pliny the Elder goes to northern and southern California, Oregon, Colorado, and Philadelphia—it's been sampled, traded, cloned, and beloved by AHA members, who make pilgrimages to the brewpub in Santa Rosa, Calif. and drink it wherever they can find it.

Pliny the Elder is "the smoothest double IPA I've ever tasted," commented Zymurgy reader Michael Copp of Coronado, Calif. "The fact that you can't always acquire it makes it even more coveted."

"Best IPA in the world, hands down," proclaimed reader Zach La Lond of Tulsa, Okla. "Consistently fresh and excellent."

Another reader, Doug Wakeman of San Jose, Calif., referred to Pliny the Elder as "liquid gold."

"The Pliny the Elder recipe has had some minor tweaks over the years but for the most part it has been a beer with a focus toward the Simcoe hop," said Cilurzo. "When I started making Pliny, Simcoe was just coming out. I had brewed with Simcoe as an experimental hop (YCR-014) and that led me to using it in Pliny."

Two Hearted Ale, an IPA from Bell's Brewery in Kalamazoo, Mich., showcases a different, but also appreciated, hop. Reader Chris Holderness of Georgetown, Texas, described the beer as "a symphony of Centennial hops. Just a fantastic beer."

"I spent 4.5 months driving around this U.S. of A. connecting the dots between microbreweries, national parks, and parkways," commented Kathleen Devine of Longmont, Colo. "This beer was my go-to for hop happiness. I wish it was available at my local beer stores."

Summed up Ryan Wiltse of Milford, Mich., "Yeah, still one of the best. Hoppy but balanced, crazy drinkable. Love those

Centennial hops. Not an in-your-face palate wrecker, but perfect in every way."

For the third straight year, Dogfish Head 90 Minute IPA finished third, but a couple of different beers muscled their way into the top five. Bell's Hopslam Ale, a winter seasonal double IPA, finished fourth in the voting (it was fifth in 2011), followed by Ballast Point Sculpin IPA, which jumped up from a tie for 17th in last year's poll and a tie for 43rd in 2011.

"No matter how many IPAs I try, I always come back to this one," wrote Nicholas Moran of Thornton, Colo., regarding 90 Minute. "It's the perfect balance of maltiness, bitterness, and hop flavor and aroma."

Lagunitas Sucks vaulted into the top 10 this year despite not appearing in the top 50 in 2012. The beer, a double IPA, was originally brewed in 2011 as a Brown Shugga' substitute due to construction-related capacity issues at Lagunitas Brewing Co., but it was so well received that it became a much-loved seasonal.

"Love, love, love this beer," commented Mike Ashley of Columbus, Ohio. "I'm a hop head and this beer delivers hops by the pound. Light bodied and very drinkable, the hop nose on this is almost unparalleled."

The Alchemist's Heady Topper, a double IPA, made a stellar debut in the poll, finishing 18th.

"I don't know of any other breweries that only produce one beer, have limited distribution, and always sell out," commented Aaron Ouellette of Pepperell, Mass. "The beer itself has never disappointed me. So balanced for being absurdly hoppy."

Following recent trends, eight of the top 10 beers in the poll are IPAs or double IPAs, with Founders Breakfast Stout and Arrogant Bastard Ale as the exceptions.

The Best of the Best

As in years past, we also kept track of which breweries received the most votes in the poll. This year's number one brewery is Stone Brewing Co. of Escondido, Calif.

- 
- ## BREWERY RANKINGS
- (T indicates tie)
1. Stone Brewing Co., Escondido, Calif.
 2. Russian River Brewing Company, Santa Rosa, Calif.
 3. Sierra Nevada Brewing Company, Chico, Calif.
 4. Dogfish Head Craft Brewery, Milton, Del.
 5. Bell's Brewery, Kalamazoo, Mich.
 6. Firestone Walker Brewing Company, Paso Robles, Calif.
 7. Founders Brewing Company, Grand Rapids, Mich.
 8. Lagunitas Brewing Company, Petaluma, Calif.
 9. New Belgium Brewing Company, Fort Collins, Colo.
 10. Deschutes Brewery, Bend, Ore.
 11. Odell Brewing Company, Fort Collins, Colo.
 12. Three Floyds Brewing Company, Munster, Ind.
 13. Avery Brewing Company, Boulder, Colo.
 14. Oskar Blues Brewery, Longmont, Colo.
 15. Green Flash Brewing Company, San Diego, Calif.
 16. The Boston Beer Company, Boston, Mass.
 17. Boulevard Brewing Company, Kansas City, Mo.
 18. Goose Island Beer Company, Chicago, Ill.
 19. New Glarus Brewing Company, New Glarus, Wis.
 - T20. Great Divide Brewing Company, Denver, Colo.
 - T20. Ballast Point Brewing Company, San Diego, Calif.
 22. Tröegs Brewing Co., Hershey, Pa.
 23. Great Lakes Brewing Company, Cleveland, Ohio
 24. Victory Brewing Company, Downingtown, Pa.
 25. Brewery Ommegang, Cooperstown, N.Y.

Stone Brewing Co. made a splash with the introduction of Enjoy By IPA.



GREEN FLASH WEST COAST IPA CLONE

RECIPE BY AMAHL TURCZYN SCHEPPACH

INGREDIENTS

for 5.5 U.S. gallons (20.82 liters)

| | |
|---------|---|
| 12.5 lb | (5.67 kg) U.S. pale two-row malt |
| 1.25 lb | (0.57 kg) Baird 30-37° L Carastan malt |
| 1.25 lb | (0.57 kg) Briess dextrin malt |
| 0.5 oz | (14 g) Simcoe pellets, 13% a.a. (90 min) |
| 0.25 oz | (7 g) Columbus pellets, 14% a.a. (90 min) |
| 0.25 oz | (7 g) Simcoe pellets, 13% a.a. (60 min) |
| 0.25 oz | (7 g) Columbus pellets, 14% a.a. (60 min) |
| 0.25 oz | (7 g) Simcoe pellets, 13% a.a. (30 min) |
| 0.25 oz | (7 g) Columbus pellets, 14% a.a. (30 min) |
| 0.75 oz | (21 g) Simcoe pellets, 13% a.a. (15 min) |
| 0.75 oz | (21 g) Columbus pellets, 14% a.a. (15 min) |
| 0.5 oz | (14 g) Simcoe pellets, 13% a.a. (0 min) |
| 0.5 oz | (14 g) Columbus pellets, 14% a.a. (0 min) |
| 1.0 oz | (28 g) Cascade pellets, 5.75% a.a. (0 min) |
| 0.5 oz | (14 g) Simcoe pellets, 13% a.a. (dry) |
| 0.5 oz | (14 g) Cascade pellets, 5.75% a.a. (dry) |
| 0.5 oz | (14 g) Amarillo pellets, 10% a.a. (dry) |
| 0.5 oz | (14 g) Centennial pellets, 10.5% a.a. (dry) |

White Labs California ale yeast WLP001

Whirlfloc at 10 minutes

Original Gravity: 1.073

Final Gravity: 1.014

SRM: 8

IBU: 99

ABV: 7.3%

90 minute boil

DIRECTIONS

Water profile should be similar to Burton-Upon-Trent's, but with roughly half the mineral content. Mash grains at 152° F (67° C) for one hour. Mash out at 165° F (74° C) for 10 minutes. Steep flameout hops for 10 minutes before chilling. Pitch cooled wort at 68° F (20° C) and allow temperature to rise naturally to 70-72° F (21-22° C). When fermentation is complete, dry hop in primary fermenter for seven days. Drink it fresh for maximum late hop character.

Extract version: Substitute 9.2 lb (4.17 kg) pale malt extract syrup for the pale two-row.

LAGUNITAS BROWN SHUGGA' CLONE

RECIPE BY AMAHL TURCZYN SCHEPPACH

INGREDIENTS

for 5.5 U.S. gallons (20.82 liters)

| | |
|---------|--|
| 14.0 lb | (6.35 kg) two-row pale malt |
| 3.5 lb | (1.59 kg) wheat malt |
| 1.0 lb | (0.45 kg) Crisp C60 60° L crystal malt |
| 1.0 lb | (0.45 kg) 10° L Munich malt |
| 4.0 oz | (113 g) Baird 105° L crystal malt |
| 4.0 oz | (113 g) Baird 150° L crystal malt |
| 8.0 oz | (227 g) dark brown sugar (45 min) |
| 1.5 oz | (42.5 g) Willamette, 4.1% (90 min) |
| 0.3 oz | (8.5 g) Horizon, 13% (45 min) |
| 1.1 oz | (31.2 g) Willamette, 4.1% (45 min) |
| 0.1 oz | (3 g) Horizon, 13% (0 min) |
| 0.3 oz | (8.5 g) Liberty, 4.5% (0 min) |
| 0.75 oz | (21 g) Centennial, 8% (0 min) |
| 0.75 oz | (21 g) Cascade, 5.4% (dry) |
| 0.75 oz | (21 g) Centennial, 8% (dry) |
| 0.75 oz | (21 g) Liberty, 4.5% (dry) |

White Labs WLP002 or Wyeast #1968

Whirlfloc at 15 min

Original Gravity: 1.100

Final Gravity: 1.020

SRM: 16

IBU: 52

ABV: 9.99%

90 minute boil

DIRECTIONS

Use carbon-filtered tap water. Adjust water with gypsum in mash. Single infusion mash at 155° F (68° C). Mash out at 168° F (76° C). Whirlpool knockout (0 min) hops for 5 minutes before chilling. Ferment at 64° F (18° C). Dry hop one week in primary. Package and age at least two months; the brown sugar flavors will come out and the hops will begin to recede after about six weeks.

Mini-Mash Version: Substitute 10 lb (4.54 kg) pale malt extract syrup for the two-row pale. Conduct a mini-mash with the 3.5 lb wheat, 1 lb Munich and crystal malts at 155° F (68° C) for one hour. Strain, rinse grains, dissolve extract, and proceed with boil.

"What a great honor it is to be recognized by our brothers and sisters in the homebrewing community," commented Stone CEO Greg Koch. "Considering that our brewery was born from a passion of homebrewing, there's no higher sign of respect that we could be given than this accolade."

Stone set the craft brewing industry abuzz last year with its introduction of Enjoy By IPA (as New Belgium Brewing Co. co-founder Kim Jordan commented in her keynote address at the Craft Brewers Conference, "I wish that had been my idea."). Enjoy By IPA, a double IPA brewed with 13 different hop varieties, is designed to be enjoyed on or before the date emblazoned on the label in order to fully experience the beer's hop-forward flavor and aroma.

"Every homebrewer knows that for many beer styles, absolutely fresh is the best way to enjoy them," said Koch. "It was out of this basic fact that the Stone Enjoy By IPA was born—well, that and our simple philosophy of 'just remember, hops... more hops!'"

Ted Mulvey of Oshkosh, Wis., commented, "This beer blew my mind when I drank it. Incredibly flavorful and hoppy, yet not overwhelmingly so. Hands down the best double IPA I've ever had."

Finishing second among breweries was Russian River Brewing Co. followed by Sierra Nevada Brewing Co. in Chico, Calif. Russian River placed five beers in the top 50, including Pliny the Elder, Consecration, Blind Pig, Supplication, and Pliny the Younger. Sierra Nevada had four beers in the top 15, including Ruthless Rye, Pale Ale, Torpedo, and Celebration.

The Boston Beer Company once again took top honors for having the Best Portfolio of beers, followed by Dogfish Head Craft Brewery. Forty brands of Samuel Adams beer received votes in the poll.

Samuel Adams continues to push the envelope and introduce new beers (and new ciders from its Angry Orchard line) at a dizzying pace, but its flagship is making the most news of late, after it was



BEST PORTFOLIO

(T indicates tie)

| | |
|---|----------|
| 1. The Boston Beer Company (Samuel Adams) | 40 beers |
| 2. Dogfish Head Craft Brewery | 38 |
| 3. Avery Brewing Company | 35 |
| 4. Cigar City Brewing | 30 |
| 5. Sierra Nevada Brewing Company | 29 |
| 6. Bell's Brewery | 28 |
| 7. New Belgium Brewing | 27 |
| T8. Stone Brewing Co. | 26 |
| T8. Goose Island Beer Company | 26 |
| 9. Boulevard Brewing Company | 25 |
| 10. Deschutes Brewery | 24 |
| T11. Founders Brewing Company | 23 |
| T11. New Glarus Brewing Company | 23 |
| T11. The Bruery | 23 |
| T11. The Saint Louis Brewery/Schlafly | 23 |
| T15. Rogue Ales | 21 |
| T15. Lagunitas Brewing Company | 21 |
| T15. Odell Brewing Company | 21 |
| T15. Great Divide Brewing Company | 21 |
| T19. Firestone Walker Brewing Company | 20 |
| T19. Three Floyds Brewing Company | 20 |
| T19. Manayunk Brewery and Restaurant | 20 |
| 22. Papago Brewing Company | 19 |
| T23. Great Lakes Brewing Company | 18 |
| T23. Southern Tier Brewing Company | 18 |
| T23. Victory Brewing Company | 18 |
| T23. Russian River Brewing Company | 18 |

Cigar City Brewing in Tampa, Fla. had
30 beers represented in the poll.

TOP IMPORTS

(T indicates tie)

- T1. Orval (Belgium)
- T1. Saison Dupont (Belgium)
- 3. Guinness Draught (Ireland)
- T4. Rodenbach Grand Cru (Belgium)
- T4. Unibroue La Fin du Monde (Canada)
- 6. St. Bernardus Abt 12 (Belgium)
- 7. Duchesse De Bourgogne (Belgium)
- T8. Samuel Smith's Oatmeal Stout (England)
- T8. Chimay Grande Reserve/Blue Label (Belgium)
- T10. Duvel (Belgium)
- T10. Cantillon Gueuze (Belgium)



Matt Hunter of Dallas, Texas summed up Rodenbach Grand Cru as “just freaking delicious.”

Support Your Local Brewery

While the Spirit of Homebrew Award is getting too difficult to determine with the influx of new breweries (more than 400 breweries opened in the U.S. in 2012), we still raise a glass to those breweries that, though small in production, score high with beer lovers. In all, more than 1,100 breweries were represented in this year’s poll, from tiny nanobreweries to the largest breweries in the world.

Many beer lovers are finding more and more appreciation for their local breweries, which are popping up in not only urban and suburban areas, but also in rural locales and small towns.

“I love Pliny, but I can’t get it in Texas,” said Jeff Holt of Fredericksburg. “So in my quest for a substitute, I’ve come across this local beer [Austin Beer Works Fire Eagle] that has the citrus hop flavor I crave!”

“The city that is flying under the radar that everyone should be checking out is Indianapolis,” remarked Cary Kirkmeyer of Galveston, Ind. “The craft beer scene is exploding there.”

“With over 60 (very good) breweries in San Diego County, it is becoming more difficult for any particular brew to really stand out from the local crowd, let alone the offerings nationally,” commented Earl Itrich of San Diego.

“I know I am a homer,” admitted Jim Elmhurst of Marine City, Mich. of his top beers list. “I love my Michigan beers!”

Revelations

Many craft beer lovers have a “defining moment” or beer that changed their perspective forever. Here’s a sampling of the “life-changing beers” mentioned in this year’s poll.

Jolly Pumpkin Luciernaga: “This beer just has that *je ne sais quoi*. It literally brings tears of joy to my eyes every time I drink it.” (Michael Long, Fort Lupton, Colo.)

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Grape and Granary, Akron OH USA

announced that Samuel Adams Boston Lager would be available in cans for the first time this summer.

Foreign Affairs

Just as in 2012, no beers produced by breweries outside of the U.S. made the top 50. The two top vote-getters among foreign breweries both hailed from Belgium, as Orval and Saison Dupont tied for first place.

“This is my yardstick for measuring other saisons,” commented Rich Pedersen of Portland, Ore. of Saison Dupont. “It’s the hallmark of the style and the one that made me fall in love with this type of beer.”

Finishing third was last year’s top import, Guinness Draught, which Philadelphia’s William Frantz described as “the reason I got into homebrewing.”

Rodenbach Grand Cru and Unibroue’s La Fin du Monde rounded out the top five.

Russian River Beatification: "This beer was damn close to a life-changing experience. Such a nice, complex sour beer." (Kent Haynes, Sandy, Utah)

Crooked Stave Surette: "What a great sour beer! A piece of my soul departed when I could no longer find this beer." (Scott Nixon, Fort Collins, Colo.)

**"This is the beer
that turned me onto
IPAs and craft beer.
Beer like this makes
me want to brew
every day."**

Samuel Adams Alpine Spring: "The beer that got me hooked on craft beer." (Benedict Wieser, Cedar Rapids, Iowa)

Green Flash West Coast IPA: "This is the beer that turned me onto IPAs and craft beer. Beer like this makes me want to brew every day." (Chad Davidson, San Diego)

Ale Asylum Hopalicious: "A great citrus flavor without being too sweet; the beer that got me started drinking craft brew." (Gary Lockwood, Stoughton, Wis.)

Odell St. Lupulin: "It's the beer that changed my life. The perfect balance of floral and citrus, crisp and refreshing without a lingering bitterness, St. Lupulin opened my eyes to a world of beers I didn't even know existed." (Catherine Golden, Murfreesboro, Tenn.)

Recipes

As usual, we're providing clone recipes for some of the top beers in the poll. Zymurgy associate editor Amahl Turcyn Scheppach put together homebrew recipes for Green Flash West Coast IPA and Lagunitas Brown Shugga'. Give them a try and see what you think!

The recipe for Pliny the Elder can be found in the July/August 2010 issue of Zymurgy; Bell's Two Hearted Ale appeared in 2011; and 90 Minute IPA appeared in the July/August 2005 issue. We've also run clone recipes in the past for many others in the top 50. Search eZymurgy or the Zymurgy index at HomebrewersAssociation.org to find the specific issues for recipes for some of those beers.

Thanks to all of the AHA members who voted in this year's poll, and for your

many great comments that helped tell the story of why you love the beers on your list.

"What a difficult task it is to rate the best beers in this golden age of brews," summed up Hans Muecke of Bolingbrook, Ill. "I am continually amazed at the wonderful selection of beers that keep coming out. Thanks brewers ... keep 'em coming."

Jill Redding is editor-in-chief of Zymurgy.

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(un)real ale: a free thinker's guide to cask conditioning

by dave carpenter



I enjoy real ale. But I don't necessarily enjoy talking about it. It's not the philosophical dilemma that bothers me (if my ale is not real, may I still drink it?), but rather the accompanying dogma. Always (or never) use a sparkler! No supplemental carbon dioxide! You mustn't snicker when someone says "bung hole!" And so on.

But cask-conditioned beer is delicious. And despite the unfamiliar equipment and esoteric terms (don't *stillage* and *bilge* sound like endocrine functions?), it is fundamentally quite simple. Fortunately, we can enjoy homebrewed real ale without subscribing to arbitrary restrictions.

In this article, I offer a heretical approach to cask-conditioning and serving your homebrew. I hope it inspires you to try it. Real ale is easy, I promise. And you don't even need to know your Kilderkin from your Butt.*

what is real ale?

The Campaign for Real Ale (CAMRA) is a UK-based organization that champions cask-conditioned ale and, through its *Good Beer Guide*, endorses pubs that serve it. CAMRA coined the term *real ale* in the early 1970s to differentiate traditional British pints from the force-carbonated, pressure-dispensed pale lagers that now enjoy worldwide ubiquity. CAMRA and the *Oxford English Dictionary* define real ale as:

A name for draught (or bottled) beer brewed from traditional ingredients, matured by secondary fermentation in the container from which it is dispensed, and served without the use of extraneous carbon dioxide.¹

Now, definitions are helpful, but they can be misleading. By the definition above, a bottle conditioned saison qualifies. But I'm not talking about saison. So let's dis-

pense (ha!) with textbook definitions and instead go with instinct. Here's what real ale means in my house:

- The style is British or has its roots in British brewing tradition: bitters, milds, porters, stouts, IPAs, and so on, including their American progeny.
- Fermentation in the serving vessel creates natural effervescence, the texture and appearance of which carry through to the glass.
- The carbonation is restrained—just over one volume of carbon dioxide (2 grams CO₂ per liter of ale) at serving temperature.
- The beer is served at cellar temperature (50-55° F/10-12° C).

An exhaustive discussion of real ale would also address topics concerning clarity and cellar logistics, but I won't consider those here because they're more relevant to pub

managers than homebrewers. If you're interested, check out Patrick O'Neill's surprisingly captivating book, *Cellarmanship*.

If you bottle, real ale couldn't be simpler. Cut back on the priming sugar to yield just over one volume of CO₂, allow to condition for a couple of weeks, serve at 50-55° F (10-12° C), and Bob's your uncle: real ale from a bottle. No special equipment required.

But what if you keg? What if you want to bring the British pub into your own home? One could, of course, acquire a stainless steel cask and a beer engine. Such equip-

ment is readily available to homebrewers, but a complete setup can easily approach \$1,000. That figure decreases if you eschew the beer engine in favor of gravity dispensing directly from the cask. Indeed, this is now a regular feature at many breweries (usually involving some amusing play on the word *firkin*), and it's one of my favorite ways to drink really fresh ale.

But getting beer out of the cask isn't really the problem. It's dealing with what goes in. Traditional equipment lets the cask's headspace fill with air as beer is withdrawn. Tapping the cask thus begins the beer's free fall to oxidized lifelessness,

giving you a day, maybe two, of fresh ale. While purists insist that oxygen exposure is part of the experience, most homebrewers I know simply won't consume 5 gallons in one or two days. I certainly haven't—at least not that I can remember.

learning from the pros

To get some ideas, I sat down with a couple of brewing professionals here in Fort Collins, Colo. Dwight Hall is head brewer at Coopersmith's Pub and Brewing, which has served real ale to the thirsty masses since 1989. Several styles are featured daily, hand drawn with classic swan-necked beer engines. Two decades ago,

parts list

LIQUID ASSEMBLY

- 1/4" MFL ball lock liquid disconnect
- 1/4" MFL swivel nut with 1/4" barb
- 3/16" beverage tubing
- 3/16" to 3/8" line splicer
- 3/8" tubing
- Valterra RP800 Chrome Rocket hand pump
- 4 stepless hose clamps (Oetiker #145)

GAS ASSEMBLY

- Polysulfone female quick disconnect with 1/4" barb
- 5/16" gas tubing
- 3/8" barb to 1/4" male NPT coupling
- Low pressure LP regulator
- 3/8" male NPT to 3/8" barb coupling
- 1/4" MFL swivel nut with 1/4" barb
- 1/4" MFL ball lock gas disconnect
- 4 stepless hose clamps (Oetiker #145)
- Teflon tape for coupling-regulator connections

instructions

1. Connect a length of 3/8" tubing to the inlet barb of the hand pump, and secure with a hose clamp.
2. Using a 3/16" to 3/8" line splicer, attach a short length of 3/16" beverage tubing to the free end of the 3/8" tubing. Secure both ends of the splicer with hose clamps.
3. Attach a ball lock (or pin lock) liquid quick disconnect to the free end of the 3/16" beverage tubing, securing with a hose clamp. Depending on your system, the tubing will either directly attach to the disconnect's hose barb, or to a 1/4" barb that attaches to the disconnect via a swivel nut. This completes the liquid side assembly.
4. Mount the liquid assembly to the stand, counter, kegerator, or novelty pedestal of your choice. Consider including a way to remove the liquid assembly for maintenance and cleaning.
5. Connect the 3/8" barb to 1/4" male NPT coupling and the 3/8" male NPT to 3/8" barb coupling to the input and outlet ends, respectively, of the low pressure liquid propane (LP) regulator. Use a couple wraps of Teflon tape to ensure airtight gas connections.
6. Connect lengths of 5/16" gas tubing to the barbs at the inlet and outlet ports of the LP regulator, securing with hose clamps.
7. Attach a ball lock (or pin lock) gas quick disconnect to the free end of the tubing connected to the regulator's outlet port, securing with a hose clamp. Depending on your system, the tubing will either directly attach to the gas disconnect's hose barb, or to a 1/4" barb that attaches to the disconnect via a swivel nut.
8. If using inline quick disconnects on the gas side, attach a polysulfone disconnect to the free end of the tubing connected to the regulator's input port, securing with a hose clamp. If not using inline gas disconnects, this end will attach directly to the output barb of a CO₂ regulator or gas distributor, depending on your system. This completes the gas side assembly.
9. Select a carbonated and conditioned keg of your finest homebrewed real ale and relieve the pressure via the valve (ball lock) or post tool (pin lock).
10. Attach the input side of the LP regulator to a CO₂ source and the output side to the keg's gas post (Note that if you do not first relieve the keg pressure, you may hear hissing as the LP regulator equalizes to its design pressure). Supply gas from the cylinder at your normal pressure: the LP regulator will reduce it down to the appropriate level for cask ale.
11. Connect the liquid assembly's quick disconnect to the keg's liquid post.
12. Draw a pint from the hand pump. This will take several strokes of the lever because the pump moves a much smaller volume than a true beer engine. Depending upon the beer, you may notice the cascading effect typically seen with stout faucets.
13. Toast and enjoy!

traditional equipment was neither affordable nor easy to find, so the brewery converted Golden Gate kegs into faux firkins. In addition to gas and liquid fittings, Golden Gates feature a bung hole (*you mustn't snicker!*), which makes filling and dry hopping a breeze. Although these kegs are hard to find these days, Coopersmith's continues to use them successfully.

Just down the street and across the Cache la Poudre River, Odell Brewing Company serves beers as varied as double IPA and fruit lambic. But its roots are firmly British, and cask-conditioned ales feature regularly on the menu. Taproom manager Jason Bowser gravity dispenses from a firkin, but he couples the beer engine (a cantankerous model brought over from Edinburgh in an overhead bin) to a good old American D-system Sankey. After the keg naturally carbonates, it is brought to

serving temperature and vented prior to meeting the engine.

Notably, both brewers dispense real ale from kegs meant for top-pressure draft systems. And both unapologetically employ cask breathers. A cask breather is simply a regulator that draws CO₂ from an external source and admits it to the cask at atmospheric pressure. When a pint of beer is served, the headspace is thus topped up with CO₂ rather than air, protecting the beer from oxidation. CAMRA somewhat famously discourages cask breathers and considers their use grounds for exclusion from its *Good Beer Guide*.² But for me, the proof is always in the glass.

I asked Hall and Bowser why hobbyists should bother with real ale, and they overwhelmingly emphasized freshness. Hall compares cask ale to homemade

spotted charlie house bitter all-grain recipe

This is my house bitter, named after a moody, mottled moggie who graciously permits two humans to share her space. Malt is the soul of this recipe, so it's worth seeking out quality barley. I'm crazy for floor malted Maris Otter, but Golden Promise and Optic will both produce equally fine ale, as will the freshest Maris Otter extract you can get your hands on. The small amount of chocolate malt is optional. Its flavor contribution is subtle, but I like the color it lends the beer. Experiment and make Spotted Charlie your own!

INGREDIENTS

for 5 U.S. gallons (19 liters)
at 70% efficiency

| | |
|---|--|
| 9.0 lb (4 kg) | Warminster Floor Malted Maris Otter (4.5L) |
| 8.0 oz (227 g) | Baird Carastan malt (30-40L) |
| 2.0 oz (56 g) | Crisp chocolate malt (600-700L) |
| 1.0 oz (28 g) | Willamette hops, 6% a.a. (60 min) |
| 1.0 oz (28 g) | East Kent Golding hops, 5% a.a. (15 min) |
| Wyeast 1469 West Yorkshire Ale or Fermentis Safale S-04 | |

Original Gravity: 1.046-1.049
Final Gravity: 1.010-1.014
IBUs: 25-35

DIRECTIONS

Mash for one hour at 153° F (67° C). Sparge to 6.5 gallons (24 liters) and boil for one hour. Chill, oxygenate, and ferment at 64-68°F (18-20° C). Leave in primary for at least 10 days, then bottle or rack to a keg. Prime with enough corn sugar to achieve 1.1 volumes CO₂ at 50-55° F (10-12° C). Serve after two weeks of conditioning.

EXTRACT VERSION

Steep the Carastan and chocolate malt for 30 minutes at 155-160° F (68-71° C). Replace the Maris Otter base malt with 6 lb (2.72 kg) Maris Otter liquid malt extract. If performing a partial boil, add half the extract at the start of the boil and the remainder with the 15 minute hop addition. If boiling the full volume, all the extract may be added at the beginning of the boil.

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bread just out of the oven, and Bowser notes that the limited shelf life of low-gravity bitters and milds means the best examples may very well be those made at home. These pros notice an appreciable difference between natural and forced carbonation, and they encourage homebrewers to experiment, source quality ingredients, focus on the final product, and avoid worrying about perceived rules.

These brewers also taught me that cask ale is less about equipment than about attitude; less about the method than about the pint. Inspired by their use of com-

mercial kegs, I decided to create a system built around the Cornelius keg.

real ale for the open-minded homebrewer

My first approach was simple. In a 2001 article in *Zymurgy*, Mike Bardallis described how to gravity-dispense from a corny keg by laying it on its side at a slight angle and reversing the roles of the gas and liquid dip tubes.³ I experimented with this approach, and although it performed admirably for a few pints, the lid eventually unseated and leaked. I concluded that kegs, like homebrewers, are

probably most effective when they remain upright. I needed a pump.

But not just any pump—I needed a food-grade version that would mimic a beer engine but cost dramatically less. Sal Emma made use of a marine galley pump in a 1997 article⁴, but his mechanical skills clearly exceed mine, and the recommended model costs well north of \$100. In 2005, Thom Cannell described how to build a beer engine from an inexpensive RV pump⁵, and internet forums indicated that other homebrewers had successfully applied his approach. There we go.



1) Ball lock keg with (a) open quick disconnect attached and (b) and gas post removed

2) Liquid assembly

3) Gas assembly

4) Gas supply with quick disconnect

5) Plant stand and small toy chest with holes for hand pump and beverage line

6) Assembled beer engine with a freshly pulled pint of bitter



I next considered the oxidation problem. You can kick your keg old school if you do so quickly. Either attach an open disconnect to the gas post or remove the post altogether (see Photos 1a and 1b), and then invite some friends over to pump, enjoy, and repeat until the keg has given its all. But if you'd rather serve your ale over a longer period, a cask breather is essential. Purpose-built models cost around \$100, but there's more than one way to skin a cask.

In a 2009 post⁶, HomeBrewTalk.com user Schlenkerla references an article in which a low-pressure liquid propane regulator substitutes for a true cask breather.⁷ Placed between a CO₂ source and the keg, this budget cask breather admits less than 0.5 psi—enough to preserve your beer, but not enough to carbonate it. If this seems like cheating, just pretend you live 1,000 feet lower in elevation because that's the kind of pressure difference we're dealing with.

The final piece of the puzzle was keeping the temperature in the mid-50s (12-14° C). Those of you with effective climate control may need to play with refrigerators and thermostats, but my house was built in the 1940s by someone with a sense of humor. Closing off one of the rooms in the colder months supplies a 50 to 60° F (10-16° C) space from roughly Oktoberfest to St. Patrick's Day. So my British real ales fit neatly between my Bavarian lagers and Irish stouts.

Putting it all together

I built my system around self-contained liquid and gas assemblies, shown in Photos 2 and 3. The liquid assembly connects the hand pump to the liquid post of a Cornelius keg. One end of the gas assembly draws from a CO₂ cylinder, and the other attaches to the keg's gas post. Including a polysulfone quick disconnect at the supply end lets me borrow the gas cylinder for other brewing chores (the matching disconnect can be seen in Photo 4).

My last name doesn't accurately represent my woodworking skills, so I fashioned a rudimentary stand from ready-made components. From a plant stand, a small

toy box, and the toothy end of a hole saw (Photo 5) emerged a simple but functional stand upon which to mount the hand pump. Photo 6 shows the final assembly.

That's really all it takes. I've included lists of the modest parts needed for the liquid and gas assemblies, but the stand can be whatever you fancy. I'm always impressed by the lengths to which homebrewers will go to make and serve beer, so I really hope someone reads this and then builds a beer engine from an actual engine. In which case, please send photos.

I hope I've encouraged you to try real ale at home. Follow the rules if you like, but don't be afraid to follow your own path. And when you find it, be sure to toast your efforts. And by all means, keep it real.

Dave Carpenter writes code by day and prose at other times. He lives in Fort Collins, Colo. with his fiancée and two cats. Read more at www.quaffable-quips.com.

* 1 Butt = 2 Hogsheads, or 6 Kilderkins, or 12 Firkins, or roughly 130 U.S. gallons

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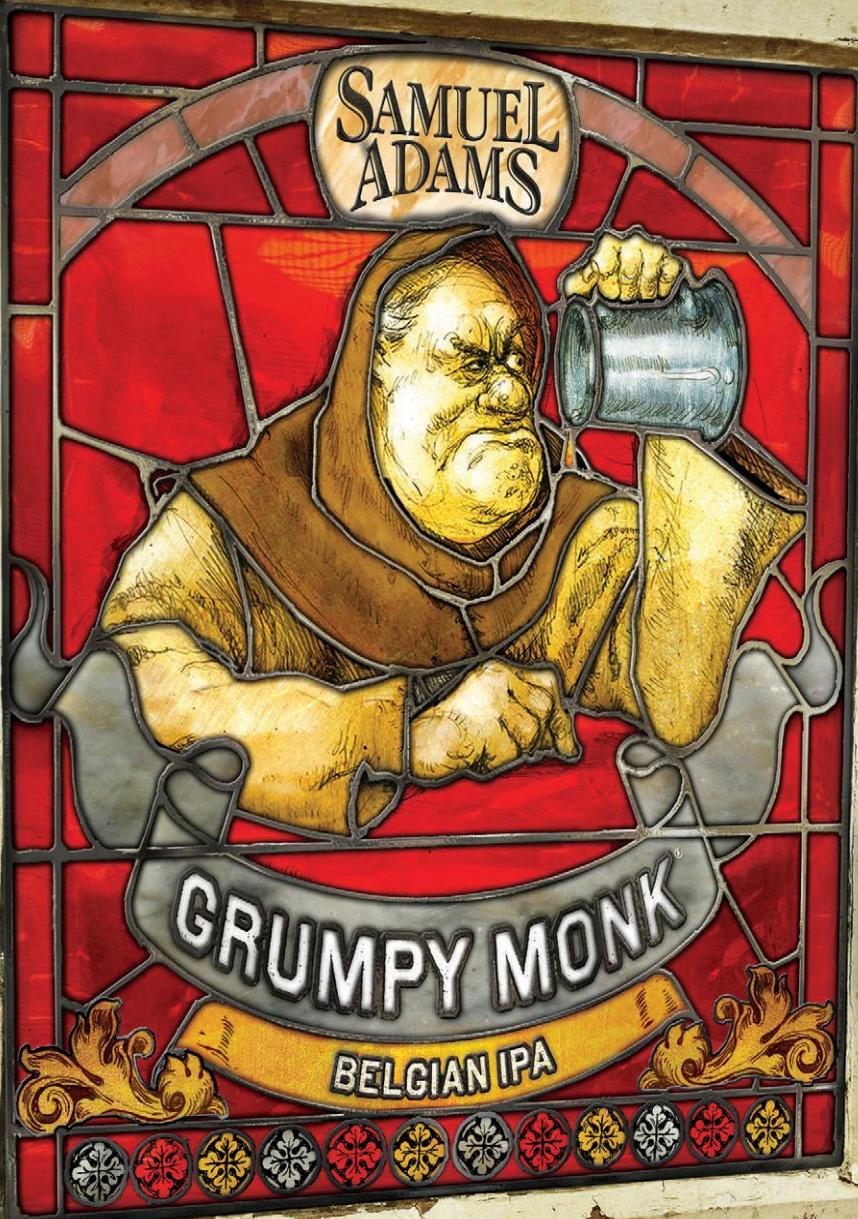
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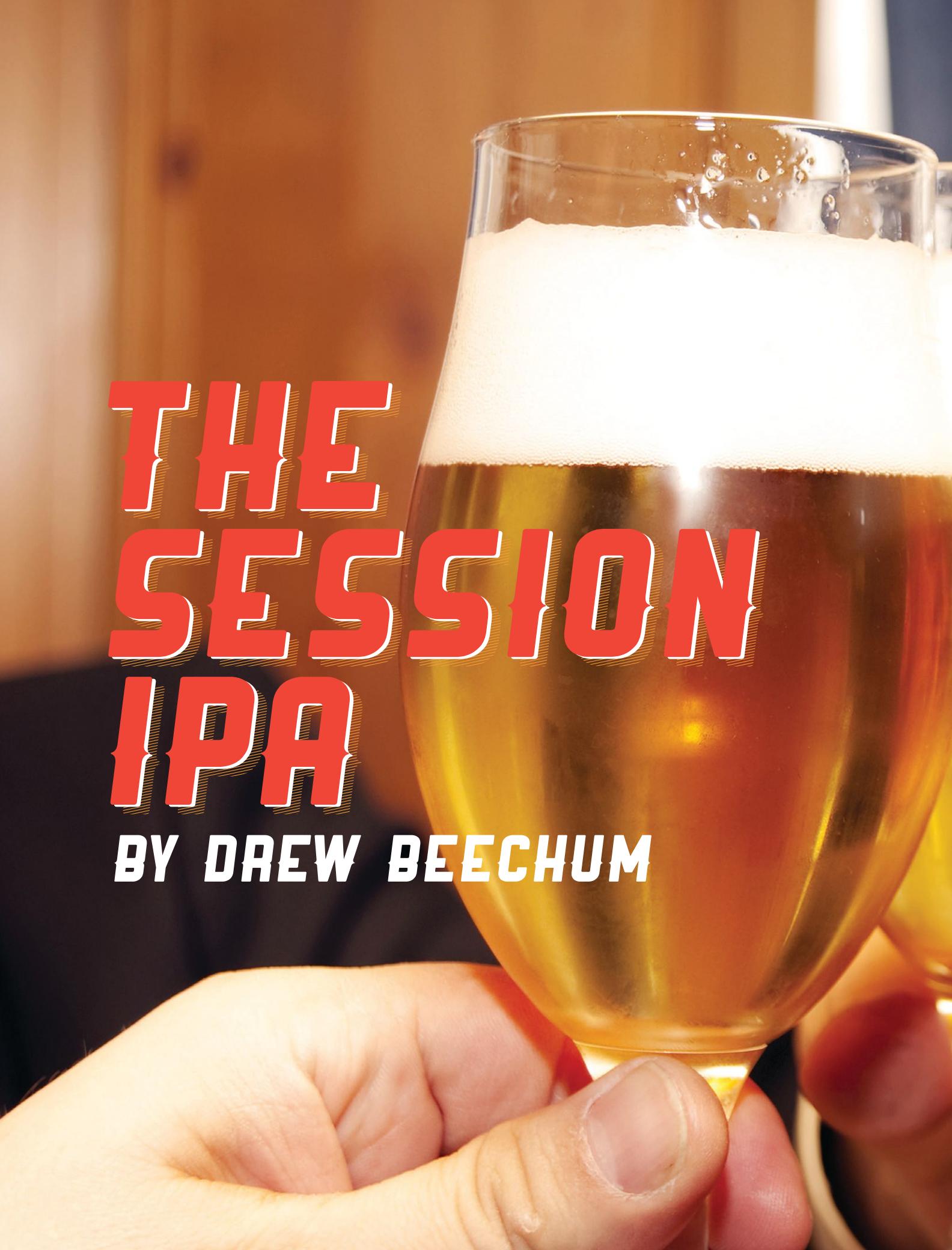
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THE SESSION IPA

BY DREW BEECHUM



A few years back, a British colleague and I had a business-related trip to Solana Beach. With the work of the day concluded, we had some time to kill before catching the Surliner back to Los Angeles, and would you look at that? The Amtrak station is right across the Pacific Coast Highway from the Solana Beach branch of Pizza Port Brewing. (If you don't think I planned that, you don't know me very well!)

Sitting at one of the picnic tables, we ordered a few beers. When I selected an IPA, my co-worker cocked an eyebrow and began to line up his shot at me. "You know that's a girly beer back home."

The idea may sound crazy to some, given the rise in popularity of the IPA, but a "Session IPA" isn't so far out of left field. In the UK, there was a transition of what the name IPA meant until it became synonymous with a sweet, low alcohol brew as exemplified by McEwan's IPA.¹

Fortunately, the West Coast breed of IPA has nothing in common with the British version, so I offered him his very first sip of IPA, American style. As that first wave of bitter hit his conscious mind, his face screwed up and it appeared as if his brain was trying to take a runner from the unexpected shock. After that, I never heard another peep about my beer preferences.

Still, there's something to be said for that British IPA—not the sweetness, but the strength. Since the introduction of the Double/Imperial/Triple/Mega/Whatever-You IPA, the standard "single" IPA has been growing increasingly in strength. From an original alcohol level of around 6.5 percent, we've seen the average IPA jump up to around 7 to 7.5.

With the growth of the standard, there's really been nothing to satisfy the need of the hophead who doesn't want to get tanked after two pints—like me. I love a good bitter slap in the face and that rich tongue coating of oils that I get from an IPA or DIPA. I love the slightly narcotic wooziness that comes from a good hop blast—but I don't always want the ethanol-induced buzz.

What happens if we marry the hop rumble of the IPA with a pale ale- (or lower-) strength beer? I would argue that a wonderful thing happens—and yes, it's different than a pale ale because it's simultaneously lighter in the malt and meaner in the hops.

THE CHANGING HOP FOCUS

After the double IPA took hold of the craft brew scene, a numbers-obsessed game emerged with brewers trumping each other with bigger and bigger IBU numbers. Statements like "this beer has 270 IBUs* (*as calculated)" became press release fodder and fuel for an arms race to prove who had the bigger hop sack.

Thankfully, brewers have figured out that just dumping more and more hop matter into the kettle doesn't mean much. After all, the rule of thumb that I learned at the knees of my brewing forefathers was that bitterness above 70-80 IBUs wasn't perceivable.

As a result, we're seeing an increased focus on packing a hoppy beer with flavorful oils that tickle the nose and tongue. The question is how to do it.

HOP BURSTING AND VEGETATION

One technique, much discussed in recent years, is "hop bursting." It's a method of adding your hops completely back-loaded into the late kettle additions. In other words, no early additions at 90 or 60 minutes, but enough at 15, 10, and later to reach your target bitterness level.

Hop bursting certainly achieves the aim of adding a ton of hop flavor, but I've never been satisfied with the beers I've tried that are strictly hop-bursted. Despite theoretically having the right amount of IBUs, the bitterness, to me, generally feels lacking and the taste is oddly muddled and green.

I think the problem comes from too much vegetation in the kettle to hit the IBUs. Hops contain chlorophyll, resins, phenols, and tannins that we don't usually want in beer.

What I prefer instead is to hit the beer with one clean charge of Magnum or Warrior to get the majority of my bitterness. I like to see about two-thirds of the bitterness come from that first addition. That frees my later additions to be all about the oils.

HOP OILS AND NEW SENSATIONS

A fantastic change in the hop landscape has been the recent increase in new hop varieties loaded with unusual flavors, aromas, and oils. It wasn't that long ago that hop growers and researchers focused almost exclusively on a breed's alpha acid, disease resistance, and yield. With today's exploding craft beer market, hop breeders are focusing more attention to the flavor factor.

In general, any new hop that you've heard people get excited about—Amarillo, Simcoe, Citra, Nelson Sauvin, Mosaic, Calypso, Galaxy—are hop flavor and oil bombs. They combine this increased intensity of oils with a lower level of cohumulone, one of hop's constituent alpha acids. CoHo, as the cool kids call it, is the acid responsible for that raspy, harsh bitterness associated with hops like Chinook or Cluster.

With lower levels of CoHo, new types are more pleasant and usable and are loaded

THE NAZZ SESSION IPA

INGREDIENTS

for 5.5 U.S. gallons (20.8 L)

| | |
|---------|--|
| 4.0 lb | (1.81 kg) Maris Otter malt |
| 4.0 lb | (1.81 kg) domestic two row malt |
| 8.0 oz | (227 g) dextrin malt |
| 8.0 oz | (227 g) cane sugar |
| 0.75 oz | (21 g) Warrior, 16% a.a. (60 min) |
| 0.75 oz | (21 g) Columbus, 15% a.a. (10 min) |
| 0.5 oz | (14 g) Falconer's Flight™ hop blend (5 min) |
| 0.5 oz | (14 g) 7Cs™ hop blend (whirlpool 15 min to ~160° F/71° C) |
| | Wyeast 1056 American ale yeast |

Boil Time: 90 minutes

Brewhouse Efficiency: 75%

Original Gravity: 1.046

IBUs: 60

SRM: 3.7

ABV: 4.7%

DIRECTIONS

Mash at 152-154° F (67-68° C) for 60 minutes.

EXTRACT VERSION:

Substitute 5.5 lb (2.49 kg) pale malt extract syrup (or a blend of Maris Otter and pale extract syrups) for the 8 lb of base malt.

*“What happens
if we marry
the hop rumble
of the IPA
with a pale ale-
(or lower-)
strength beer?”*



THE ENGLISH SESSION IPA

down with essential oils like limonene, citral, and myrcene, which carry notes of citrus and tropical fruit. And let's talk of those "others"—the new hops like Citra contain flavors never before captured in hops. We've gotten so used to hop flavors being "piney," "spicy," "herbal," and "citrus" that to have a hop that smells like mangos or grapes is shocking and invigorating. Good thing you now have a style of beer solely focused on hop flavor that is sessionable!

To start crafting a Session IPA, let's start with the basics.

WATER

For your water treatment, keep it simple; there's not a lot of need to be too aggressive with it. Add a small amount of gypsum, if necessary, to swing the sulfate-to-chloride ratio to the sulfate side. This will help bump up the hop bitterness. But remember you're adding a relatively large dose of hops to this, so you don't need much.

WHIRLPOOL AND DRY HOPS

I don't care if you use an immersion coil or a counterflow chiller, you're going to need a post-boil whirlpool to clear the hop debris. While you're here, you might as well add in a few more hops. Just give the wort a hearty stir until you get a

INGREDIENTS
for 5.5 U.S. gallons (20.8 L)

7.5 lb (3.4 kg) Maris Otter malt
8.0 oz (227 g) Simpsons medium crystal malt
1.0 oz (28 g) Pilgrim, 12% a.a. (60 min)
0.5 oz (14 g) Pilgrim, 12% a.a. (10 min)
0.5 oz (14 g) Pilgrim, 12% a.a. (knockout/whirlpool)
White Labs WLP007 dry English ale yeast

Boil Time: 90 minutes
Brewhouse Efficiency: 75%
Original Gravity: 1.040
IBUs: 49
SRM: 10.6
ABV: 4%

DIRECTIONS
Mash at 154° F (68° C) for 60 minutes.

EXTRACT VERSION:
Substitute 5.6 lb (2.54 kg) pale malt extract syrup (or Maris Otter syrup) for the 7.5 lb of base malt. Steep crystal malt in 160° F (71° C) water for 30 minutes. Dissolve extract and proceed with boil.

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healthy whirlpool formed, then chuck in another ounce of hops. Let the kettle spin for 15 minutes and then start your chill.

On the other side of the process, when your ferment is done, I don't advocate massive amounts of dry hops in these beers. Again, the idea should be lots of hop oomph, but without getting too muddled. Smaller multiple doses, like what some big IPA producers recommend, might be interesting if you can restrain yourself.

ON MALT AND MASHING

Even though we usually start with the malt, this is an upside-down beer, so let's end with it this time. Keep it simple! Use some pale malt (or a mix of pales like my favorite—half two-row, half Maris Otter) and maybe a small handful of light crystals or the toasted aromatic malts to give a little extra something.

One thing to be extra careful about—don't oversparge this beer! The last thing you need to do is leach a bunch of husk tannins in your brutally bitter beer. In fact, consider doing the extreme opposite and make a no-sparge beer! If you forgot how to batch sparge, basically boost your grain by one-third and use the total amount of water you would have sparged with. Look it up, whippersnappers! Brew In A Bag (BIAB), the technique of mashing with all the water and the grain together in a bag held in your boil kettle, would be a good approach as well.

On the mash temperature range, remember we're cheating our body a little here and loading the bitter edge. Mash this one at the lower end: 152° F (67° C). But 155° F (68° C) would be even better!

SESSION IPA IN A NUTSHELL

Taking everything we've talked about and distilling it to its essence, here are Drew's handy tips for making a session IPA.

- Keep the gravity no higher than 1.055.
- Keep the malt bill simple: a mix of pale malts, one or two light kicker malts to provide extra structure, and perhaps a small amount of sugar for an extra-dry finish.
- Mash at 152 to 155° F (67 to 68° C).



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BITTER BEER FACE SESSION IPA

If all you want is a searing hop experience, then this is the bad boy for you! At twice the IBUs of the gravity, consider yourself forewarned!

INGREDIENTS

for 5.5 U.S. gallons (20.8 L)

| | |
|--------|---|
| 9.0 lb | (4.08 kg) domestic pale malt |
| 8.0 oz | (227 g) dextrin malt |
| 1.0 oz | (28 g) Warrior, 16% a.a. (60 min) |
| 0.5 oz | (14 g) Chinook, 13% a.a. (60 min) |
| 0.5 oz | (14 g) Columbus, 15% a.a. (10 min) |
| 0.5 oz | (14 g) Columbus, 15% a.a. (knockout/whirlpool) |
| 1.0 oz | (28 g) Columbus, 15% a.a. (dry hop 1 week) |
| | White Labs WLPO01 California/Wyeast 1056 American/Safale US-05 ale yeast |

Boil Time: 90 minutes

Brewhouse Efficiency: 75%

Original Gravity: 1.047

IBUs: 86

SRM: 5.3

ABV: 4.5%

DIRECTIONS

Mash at 152° F (67° C) for 60 minutes.

EXTRACT VERSION:

Substitute 7 lb (3.18 kg) pale malt extract syrup for the pale and dextrin malts.

THE TROPICAL SESSION WHITE IPA

I really love wheat in beers with IPA-level hopping. There's something about the sweetness of the wheat that pairs up well with the newfangled tropical fruit hops.

INGREDIENTS

for 5.5 U.S. gallons (20.8 L)

| | |
|--------|--|
| 5.5 lb | (2.27 kg) domestic pale malt |
| 4.0 lb | (1.81 kg) white wheat malt |
| 1.0 oz | (28 g) Warrior, 16% a.a. (60 min) |
| 0.5 oz | (14 g) Amarillo, 8.5% a.a. (knockout/whirlpool) |
| 0.5 oz | (14 g) Citra, 11% a.a. (knockout/whirlpool) |
| 0.5 oz | (14 g) Galaxy, 11% a.a. (knockout/whirlpool) |
| | White Labs WLP090 San Diego ale yeast |

Boil Time: 90 minutes

Brewhouse Efficiency: 75%

Original Gravity: 1.046

IBUs: 55

SRM: 5.3

ABV: 4.5%

DIRECTIONS

Mash at 154° F (68° C) for 60 minutes.

EXTRACT VERSION:

Substitute 4.2 lb (1.9 kg) pale malt extract syrup for the pale malt and 3 lb (1.36 kg) wheat malt extract syrup for the wheat malt.

- Watch your runoff to prevent over-extraction.
- Treat your brewing water with gypsum to slightly favor sulfate over chloride.
- BU:GU Ratio of 1+ (e.g. 49 IBUs: 1.040 OG=49/40=1.225)
- Use a relatively neutral bittering hop for the majority of your IBUs to avoid excess green material.
- Backload many of your hops into the end of the boil to emphasize flavor

and aroma.

- Use relatively clean yeast—nothing that throws a lot of esters.
- Dry hop sparingly. Try to avoid adding massive green to the beer.
- Carbonate the beer to your preference: lower carbonation (1-2 volumes) will reveal more hop flavor with less perceived “fluffiness;” higher carbonation (2.5-3 volumes) will provide more stinging bitterness, a more aggressive aroma, and a “fluffier” body.

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PUTTING IT TOGETHER

Chip Walton of BrewingTV fame started a new endeavor this year in the form of his YouTube show "Chop & Brew." A big fan of the band 311, Walton discovered via bassist P-Nut that 311 loves craft beer—in particular big Belgians and hoppy sessionable beers. In an effort to give home-brewers and 311 fans a way to doubly celebrate, Walton assembled a multi-brew day and filmed it for Episode 3 of Chop & Brew. For the sessionable hoppy beer, Walton and I worked on modifying my

Pliny the Toddler Session IPA recipe (see the November/December 2011 Zymurgy) and he christened it "The Nazz."

In "Brewing on the Ones," (November/December 2012 Zymurgy), I talked about the importance of having a story behind your ingredients choices. For The Nazz, we started with my traditional base of domestic two-row and Maris Otter. I love that mix of light, crisp two-row and the toasted biscuit flavor of Maris Otter as the base for a hop-forward beer. A little bit of dextrin

malt provides body, and a little bit of sugar helps ensure the beer will finish dry.

The hops start with Warrior—it provides a clean, neutral bitterness and its high alpha minimizes vegetation. I suggested Columbus for that "dank" hoppy flavor. Then, since the band's music is a mix of styles, we chose the two big American hop blends available on the market to close the beer out.

Walton decided that he wanted to BIAB, so he made a few modifications to the grain bill to fit it in his 8-gallon kettle and brewed The Nazz on a brutally cold Minnesota day.

The beer fermented in a fast three days and finished tight and clean. Chip was kind enough to send me a few bottles and it was everything we had hoped for: bright, clear, and crisp with a cracker-grain finish. The immediate aroma is dense and herbal with forward tropical notes. The malt gets slammed by the bitterness and it rides all the way through, oily and fabulous.

There are myriad other combinations to try. Included are the recipes for The Nazz and a few others to get you started, but don't stop there. This should be all about the love of the hop, delivered in a sessionable medium.

Drew Beechum is a frequent contributor to Zymurgy and a member of the AHA governing committee. He lives in Pasadena, Calif.



REFERENCE

1. McEwan's IPA, confusingly called McEwan's Export in the UK, is now owned by Wells & Youngs, and is produced by Caledonian in Edinburgh. It has 25 IBUs and about 4.5% abv, and is technically a Scottish 80 shilling. As of spring 2012, according to TalkingRetail.com, it was Scotland's "biggest" ale, and was the third highest selling premium ale in the UK take-home market. See "Wells & Youngs Boosts Premium Ale Category with McEwan's." April 23, 2012. www.talkingretail.com/products/product-news/wells-youngs-boosts-premium-ale-category-with-mcewans

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Alpha: 8.7% Beta: 1.7%
Aroma - Slightly Spicy & Fruity, Citrus, Hop &
Lemongrass, Light, Herby, Waxy, Citrus
Typical Beer Styles - All, Barley Wine, Saison,
Lager, Wheat, Pale Ale, Pilsner, India Pale Ale

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Aroma - Juicy, Tropical, Citrus, Hop & Citrus
Typical Beer Styles - All, Barley Wine, Saison,
Lager, Wheat, Pale Ale, Pilsner, India Pale Ale

UK FUGGLE
Alpha: 4.5% Beta: 2.5%
Aroma - Juicy, Tropical, Citrus, Hop & Citrus
Typical Beer Styles - All, Barley Wine, Saison,
Lager, Wheat, Pale Ale, Pilsner, India Pale Ale

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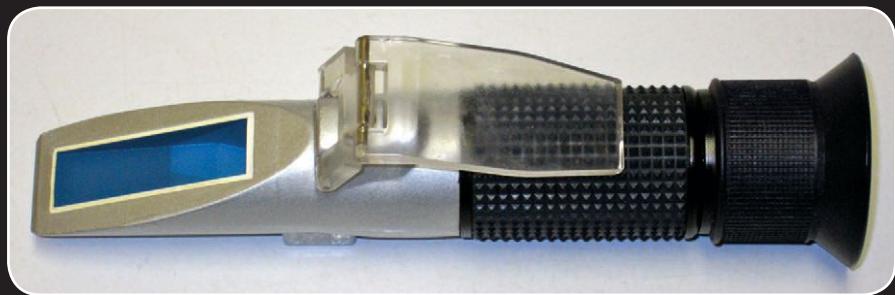
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USING A REFRACTOMETER

BY SEAN TERRILL

If you've been brewing long enough, you will undoubtedly have experienced some of the frustration of using a hydrometer. Either the delicate glass instrument broke, or a hot wort sample didn't cool fast enough, or repeated sampling claimed an unacceptable amount of your precious beer. While the trusty hydrometer is an indispensable tool in the brewer's arsenal, it may not be the right tool for every job. Enter the refractometer.



Due to its completely different mode of operation, a refractometer has several advantages over a hydrometer. While a quality model will contain glass optics, they are enclosed in a rugged metal body, greatly increasing the instrument's durability. And since the sample size is measured in drops, not ounces, there are no concerns about wasted product. Perhaps most significantly, the small sample will cool almost instantly, allowing hot wort readings to be taken in real time. Used properly, a refractometer can dramatically improve your brewing — or even replace your hydrometer entirely.

WHAT IS IT?

A refractometer is an instrument used to measure the degree to which light is slowed when passing through a sample (the refractive index). Since the concentration of a solution affects its refractive index, that concentration can be quantified using a simple optical technique. Light enters the refractometer through a cover plate (labeled A in Figure 1), then passes through a thin layer of liquid (B), where it is bent (refracted) by some characteristic angle. The light then passes through a prism (C) and lens (D), which focuses the light onto a reticle (E). The reticle is printed with a scale used to obtain the measurement. When looking through an eyepiece (F), the visual field will be split into colored and colorless portions; the point at which they intersect the reticle is the measured value. See Figure 2 for examples.

Although refractometers have applications in a number of industries, the

models used by brewers are calibrated to measure sugar solutions. As such, they read in degrees Brix, abbreviated as “°Bx.” 1°Bx is defined as a 1 percent sucrose solution by weight—that is, 1 gram of sucrose dissolved in 99 grams of water. You may already be familiar with degrees Plato (°P); while the two units are defined differently, they are so similar that for brewing purposes they can be used interchangeably.

SELECTING A REFRACTOMETER

Refractometers can be divided into two general categories, digital and analog, with a further division into benchtop and handheld models. For serious laboratory work, benchtop refractometers are preferred, but they are poorly suited to the mobile workflow of a small brewery, and their cost (\$500 or more) is prohibitive for most homebrewers. Among handheld models, digital refractometers have the advantage of minimizing operator error, but their batteries must be maintained,

and they are susceptible to interference from nearby light sources.

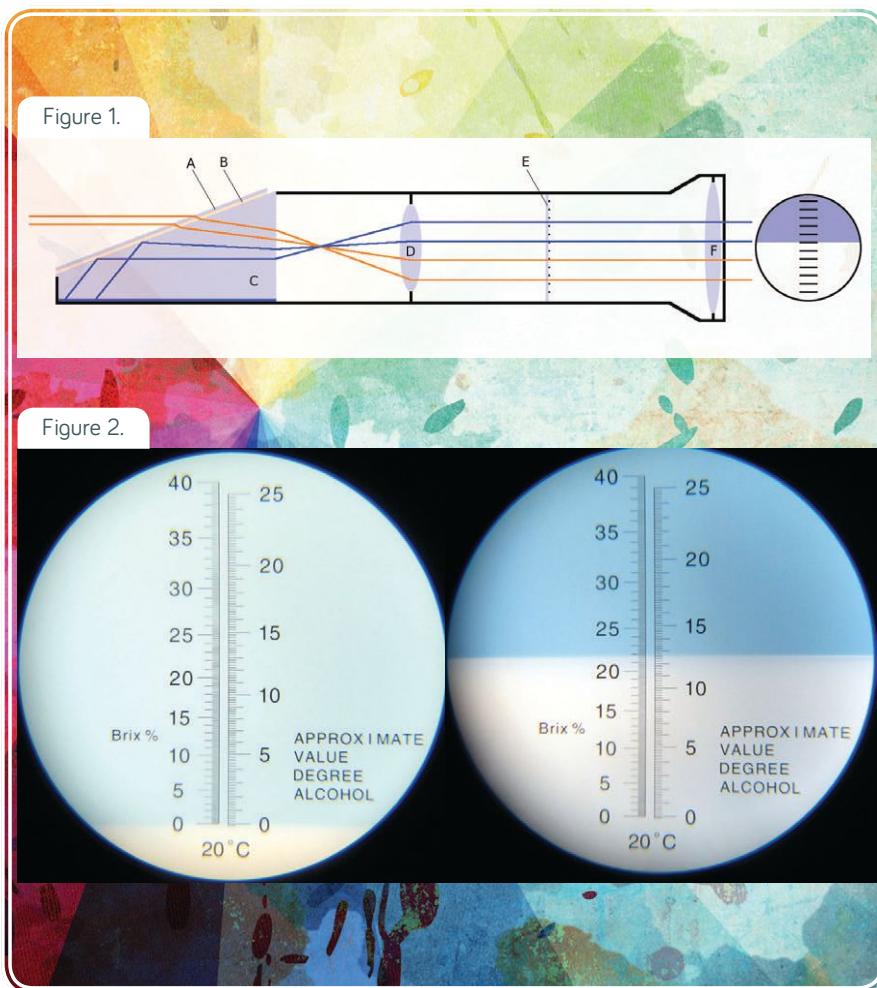
Handheld analog models like the one in the photo on page 49 are the most common choice for home and craft brewers, and are readily available from laboratory supply companies, homebrew shops, and various online retailers. Be sure to select a refractometer with a scale covering the entire range of gravities you plan on brewing: 0-32°Bx (1.000-1.139 SG) is common. Prices range from about \$30 to over \$100, depending on features. These may include:

- automatic temperature compensation (ATC); a bimetallic strip is used to automatically adjust for variations in temperature. Standard on most models.
- a built-in light source; a battery-powered bulb or LED allows readings to be taken in low-light environments.
- a dual-unit reticle; in addition to the standard degrees Brix, a second scale reads in an alternate unit such as specific gravity.

CALIBRATING A REFRACTOMETER

As with any instrument, the measurements obtained from a refractometer are only as good as the calibration of the unit. A new refractometer should be calibrated for both its zero point and another value; thereafter a zero calibration at the beginning of each brew day is sufficient. Performing a zero calibration is quite simple: after ensuring that the refractometer is at its calibration temperature (most likely 20° C/68° F), place a few drops of water on the sample prism, close the cover plate, and take a reading. The measured value should be 0.0°Bx. If it is higher or lower, the lens can be moved up or down using a knob or screw located on the refractometer body.

In order to perform a two-point calibration, a measurement of a reference sucrose solution (20.0°Bx, for example) is made. These solutions can be purchased from laboratory supply companies, but are also quite easy to make at home. Since degrees Brix measure the sucrose content of a solution by mass, a 20.0°Bx reference solution can be prepared by dissolving 20.0 g of table sugar in 80.0 g of water.



If a precise enough scale is not available, these quantities can be eyeballed and the solution's density measured using a hydrometer. In either case, it is essential that the instruments used to calibrate the refractometer have themselves been calibrated; any errors introduced at this stage will be carried forward through all subsequent refractometer readings.

Once the refractometer has been calibrated using sugar, one additional calibration must be performed. Wort is a complex combination of sugars, with maltose the most prevalent. As each sugar in solution has a slightly different effect on the refractive index of the wort, a reading taken directly from the refractometer will not exactly match the wort's gravity. In order to compensate for this effect, the refractometer reading is divided by a wort correction factor (WCF). The WCF is determined by measuring a wort sample using both the refractometer and a hydrometer, then dividing the refractometer reading by the hydrometer reading. The resulting value will likely be in the range of 1.02 to 1.06. Assuming a wort correction factor of 1.04 can yield good results, but each wort (and to a lesser extent, each refractometer) is unique, and it's best to determine a WCF that accurately represents the beers you typically brew. Brewers who incorporate large quantities of adjuncts, for example, may find that the WCF needs to be reduced.

MEASUREMENTS AND MAINTENANCE

The basic method of taking measurements using a refractometer is simple. Place a few drops of wort on the sample prism, close the cover plate, point the refractometer at a bright light source, look through the eyepiece, and take your reading. Take care not to let your hot wort sample cool in the open air. Since the sample size is only a few drops, evaporation can significantly increase the sample's gravity. Instead, use a syringe or medicine dropper to collect the refractometer sample; the small volume of wort will cool in the glass dropper in just a few seconds. Of greater concern is the temperature of the refractometer itself. Most models are calibrated at a temperature of 20° C (68° F); if your refractometer has an ATC function, it likely works in the

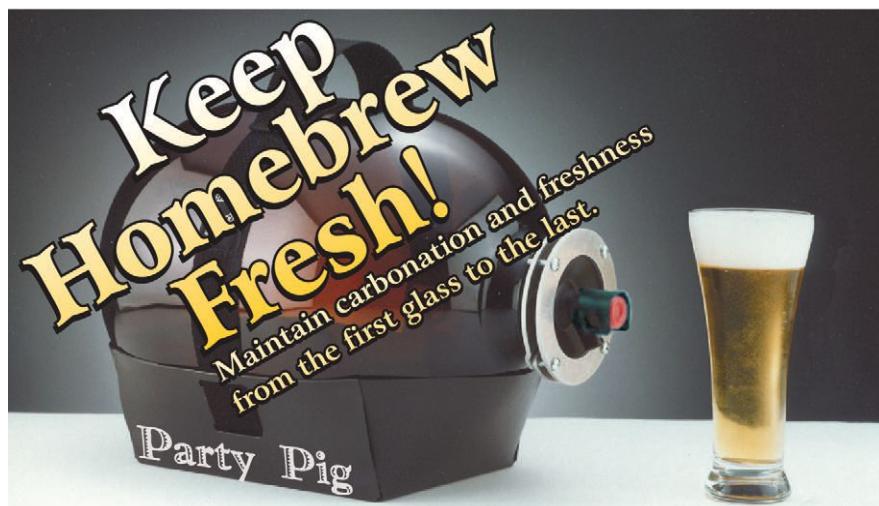
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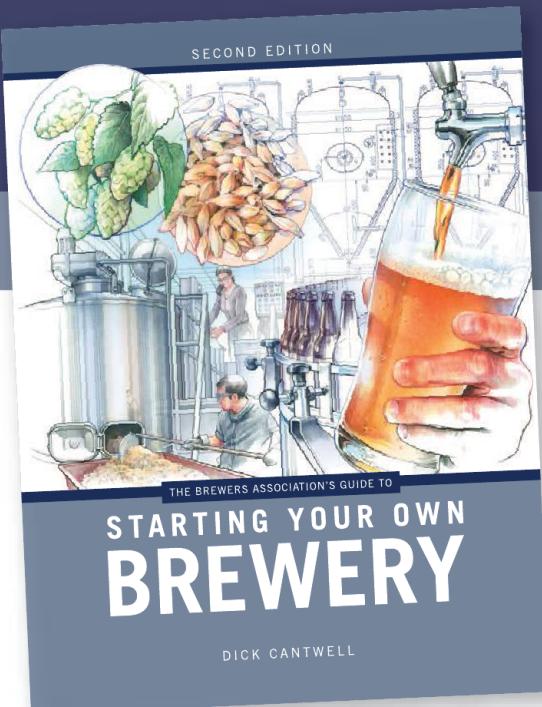


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range of 10-30° C (50-86° F). Remember, though, that refractometers are designed to measure sucrose solutions, not wort, and the ATC mechanism itself will introduce a small amount of error if the refractometer is not kept near its calibration temperature. Consult your instrument's documentation for specifics.

Unlike glass hydrometers, handheld refractometers are fairly durable instruments and should hold up well to the minor insults that inevitably occur in the brewery. After each use, rinse the prism and cover plate with warm water and either air it dry or wipe it with a soft cloth. Remove any remaining water before taking the next measurement in order to prevent sample dilution. If you drop the refractometer, perform a two-point calibration to ensure that it is still functional. If it cannot be adjusted to give accurate measurements at both points, then the refractometer is defective and needs to be replaced.

ESTIMATING FINAL GRAVITY

Perhaps the greatest limitation of a refractometer is its inability to directly measure the final gravity (FG) of a beer. Recall that the refractive index of a solution depends on its concentration.

Since beer is a three-phase solution of water, alcohols, and sugars, a refractometer reading of beer during or after fermentation will not give its gravity directly. However, the original gravity, final gravity, and final refractometer reading are interrelated; it should be mathematically possible to calculate any of these values given the other two. And indeed, a widely disseminated equation is used for this purpose. Unfortunately, it does not give results comparable to a hydrometer.

In order to develop a better equation, I took careful hydrometer and refractometer readings of 12 beers representing a wide range of gravity and attenuation levels, then fit a simplified cubic polynomial to the data. Evaluation of the resulting equation using data from multiple breweries has shown that it provides results nearly as precise as an inexpensive hydrometer, with 88 percent of beers having an estimated FG within

± 0.002 of the actual value. If greater precision is desired, a refractometer can still be used to monitor fermentation without wasting a significant volume of beer; once periodic refractometer readings stop dropping, the beer has finished fermenting and the FG can be obtained using a precision hydrometer.

The FG equation is available as both an online calculator and a downloadable spreadsheet at <http://seanterrill.com/refractometer/>.

CONCLUSION

With their rugged construction and rapid operation, refractometers are well suited for use in the brewery. No instrument is perfect, but as long as its capabilities and limitations are kept in mind, a refractometer can be an invaluable addition to your homebrewing equipment, accomplishing tasks no hydrometer could.

Sean Terrill has been homebrewing for nine years, and is the owner and brewer of Two Mile Brewing, a brewpub in Leadville, Colo.

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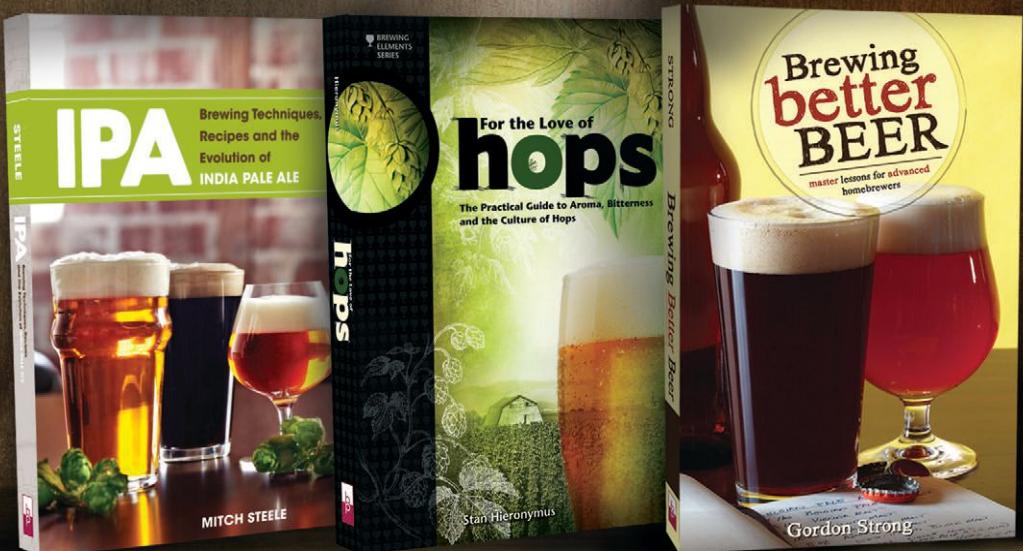
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BIA
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by Amahl Turczyn Scheppach

Peak-to-Peak Pro-Am

On March 23, a dedicated group of homebrewers and judges braved the snow to gather at Echo Brewing in Frederick, Colo. for the 2013 Peak-to-Peak Pro-Am. The event was sponsored and coordinated by the Indian Peaks Alers Homebrew Club. This was the club's 5th annual competition since the first one they hosted in 2009 at Left Hand Brewing in Longmont, Colo.

The Indian Peaks Alers Homebrew Club formally organized in late 2007 at Left Hand as an offshoot of homebrew classes taught by veteran homebrewer Don Blake. The initial group of founding brewers has since added several more dedicated members, resulting in a well-rounded club of about 40 people. The IPAers have several annual events, an active barrel project lineup, and also organize the annual Peak-to-Peak Pro-Am competition.

This year, the Pro-Am received a warm welcome from Echo Brewing. Daniel and Dennis Richards had just opened their brewery in the spring of 2012 and were not quite ready to participate in a Pro-Am. They were generous hosts for this event, and judges enjoyed sampling their beers in addition to the competition entries.

More than 400 beers were entered in the 2013 Peak-to-Peak competition from brewers all over the country, but there was a great showing from Front Range homebrew clubs, as evident by the winners list. Pro-Am winners (see the sidebar) will collaborate with the corresponding breweries to make commercial batches of their recipes for the 2013 Great American Beer Festival Pro-Am.

This year's best of show winner was James "Mad Brewer" Frazer of Bedford, Va. for

Tuxedo Speedo

ALL-GRAIN RECIPE

INGREDIENTS

for 5 U.S. gallons (19 liters) [recalculated from the original 3.5-gallon batch size]

| | |
|----------------|--|
| 10.0 lb | (4.53 kg) pale two-row malt |
| 1.4 lb | (649 g) dextrin malt |
| 8.6 oz | (244 g) 120° L crystal malt |
| 11.4 oz | (324 g) black patent malt (in mash) |
| 0.18 oz | (5 g) Columbus pellets, 15% a.a. (60 min), 12.2 IBU |
| 0.36 oz | (10 g) Simcoe pellets, 13% a.a. (60 min), 21.1 IBU |
| 0.43 oz | (12 g) Cascade pellets, 5.75% a.a. (45 min), 10 IBU |
| 1.43 oz | (41 g) Cascade pellets, 5.75% a.a. (15 min), 10 IBU |
| 1.43 oz | (41 g) Chinook pellets, 13% a.a. (15 min), 22.5 IBU |
| 1.43 oz | (41 g) Amarillo pellets, (0 min) |
| 0.71 oz | (20 g) Cascade pellets, (dry, 21 days) |
| 0.71 oz | (20 g) Mosaic pellets, (dry, 21 days) |
| 1.0 tsp | (5 g) Irish moss American ale yeast |

Target Original Gravity: 1.067

Approximate Final Gravity: 1.016

Approximate color: 33 SRM

IBUs: 75.8

Boil: 90 minutes

DIRECTIONS

Mash grains at 152° F (67° C) for one hour. Ferment at 68° F (20° C) until terminal gravity is reached. Add dry hops in secondary and package after three weeks.

Extract Version: Substitute 7.3 lb (3.3 kg) light malt extract syrup for the pale two-row malt. Steep remaining grains at 155° F (68° C) for one hour. Rinse grains, dissolve extract syrup, and proceed with boil.



PEAK-TO-PEAK PRO-AM WINNERS

Pro-Am winners from the 2013 Peak-to-Peak Pro-Am, with their respective commercial brewery hosts.

Bootstrap Brewing: Cascadian Dark Ale/Black IPA, James Frazer, Bedford, Va. (Labrewtory Homebrew Club)

Crabtree Brewing: Scottish Export 80/-, Scott Buchholz, Manitou Springs, Colo. (Brew Brothers of Pikes Peak)

Echo Brewing: Saison, Bob Hall, Laramie, Wyo. (Laramie Brew Club)

Left Hand Brewing: Schwarzbier, Greg Toothaker, Erie, Colo. (Indian Peaks Alers)

Oskar Blues: Belgian Strong, Ed Moore, Highlands Ranch, Colo. (Foam on the Range)

The Pumphouse Brewery: Extra Special/Strong Bitter, Randy Walsh, Fort Collins, Colo. (Liquid Poets)



AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

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

July 7
Westgate Brewers Stout Extravaganza
Port Melbourne, Victoria, Australia.
Entry Deadline: 6/28/2013
www.westgatebrewers.org

July 7
Brisbane Amateur Beer Brewers Annual Competition
Brisbane, QLD, Australia. Entry Deadline: 6/22/2013. www.babbrewers.com/

July 12
Indiana State Fair Brewers' Cup
Indianapolis, IN. Entry Deadline: 6/28/2013
www.brewerscup.org

July 13
Amador County Fair Homebrew Competition
Plymouth, CA. Entry Deadline: 6/29/2013
<http://brewangels.com>

July 13
2013 Buffalo County Fair Beer/Wine/Mead Competition
Kearney, NE. Entry Deadline: 7/8/2013

July 20
Michigan Mead Cup
Metamora, MI. Entry Deadline: 6/30/2013
www.michiganhoneyfestival.org

July 20
E.T. Barnette Homebrew Competition
Fox, AK. Entry Deadline: 7/17/2013
www.mosquitobytes.com/Den/Beer/Events/Events.html

July 20
Battle of The Home Brews
Aurora, CO. Entry Deadline: 7/2/2013
www.arapahoecountyfair.com

July 20
Battle of the Brews
Harrington, DE. Entry Deadline: 6/1/2013
www.delawarestatefair.com/p/Get-Involved/Exhibitors/235

July 20
El Paso County Fair Homebrew Competition
Calhan, CO. Entry Deadline: 7/18/2013
www.brewbrosco.com

July 20
Open Class Beer and Wine Judging
Eau Claire, WI. Entry Deadline: 7/13/2013
<http://eauclaire.uwex.edu/eau-claire-county-fair/>

July 20
Hopsanity in the Hill City
Lynchburg, VA. Entry Deadline: 7/11/2013
<http://hopsanity.hillcityhomebrew.org/>

July 21
2013 SABC Amateur Brewing Challenge
Enfield, Australia. Entry Deadline: 7/17/2013

July 23
Antelope Valley Fair HomeBrew Competition
Lancaster, CA. Entry Deadline: 7/19/2013
www.avfair.com

July 24
Highland Games Celtic Ale and Mead Competition
Billings, MT. Entry Deadline: 7/23/2013
<http://rimrockbrewersguild.blogspot.com/2013/04/celitic-comp.html>

July 27
4th Annual All American Brewoff
Fort Smith, AR. Entry Deadline: 7/13/2013
<http://rivervalleyaleraisers.com>

July 27
2013 German Fest Stein Challenge
Milwaukee, WI. Entry Deadline: 7/13/2013
<http://germanfesthb.beerbarons.org/>

July 27
17th Annual New Jersey State Fair Homebrew Competition
Augusta, NJ. Entry Deadline: 7/13/2013
www.scubabrewclub.com

July 27
Crystal Coast Brew Off
Trenton, NC. Entry Deadline: 7/25/2013
<http://Beerarmy.com>

July 28
Ventura County Fair Amateur Beer Contest
Ventura, CA. Entry Deadline: 7/27/2013
www.venturacountyfair.org

August 3
5th Annual Beehive Brew-Off
Salt Lake City, UT.
www.beernut.com/beercomp/

August 3
St. Francois County Fair Homebrew Competition
Park Hills, MO. Entry Deadline: 8/1/2013

August 3
St. Mary of the Rockies Harvest Fest
Bailey, CO. Entry Deadline: 7/24/2013
www.stmaryrockies.org

August 3
Best of the Bay
Bellingham, WA. Entry Deadline: 7/29/2013
<http://bellinghambrewers.com>

August 9
Kentucky State Fair Homebrew Competition
Louisville, KY. Entry Deadline: 7/1/2013

August 9
National Capital Homebrewing Competition
Ottawa, Ontario, Canada.
Entry Deadline: 8/2/2013
www.nationalcapitalbeerweek.com

August 10
Denver County Fair Homebrew Competition
Denver, CO. Entry Deadline: 8/8/2013
www.denvercountyfair.org

August 10
Summer Smash Homebrew Contest
Sonoita, AZ. Entry Deadline: 8/10/2013
www.facebook.com/events/434550619966879/

August 10
Brew Jersey Homebrew Comp One
Egg Harbor City, NJ. Entry Deadline: 8/3/2013
<http://brewjersey.comeze.com/>

August 10
Deer River Bar-b-que and Brew Fest
Deer River, MN. Entry Deadline: 8/10/2013
<http://deerriver.org/events/event.php?number=116>

August 15
9th Annual Western Idaho Fair Beer Competition
Boise, ID. Entry Deadline: 8/14/2013

August 16
Minnesota State Fair Homebrew Competition
Saint Paul, MN. Entry Deadline: 8/3/2013
<http://mnstatefair.brewcomp.com/>

August 17
Beer & Sweat
Erlanger, KY. Entry Deadline: 8/8/2013
<http://beerandsweat.brewcomp.com/>

August 24
East Idaho State Fair Homebrew Competition
Idaho Falls, ID. Entry Deadline: 8/16/2013
www.wildhops.webs.com

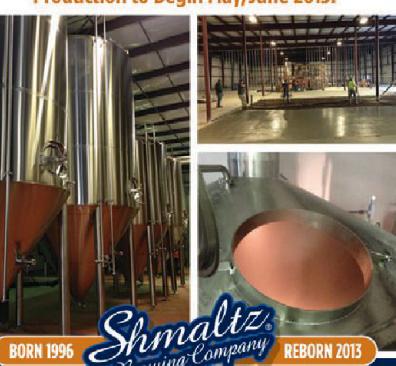
August 24
2o. Concurso de Cervejas Artesanais da ACervA Catarinense
Blumenau, Santa Catarina, Brazil.
Entry Deadline: 8/22/2013
<http://acervacatarinense.com.br/ii-concurso-estadual>

August 24
Macon Beer Festival Homebrew Competition
Macon, GA. Entry Deadline: 8/9/2013
www.themaconbeerfest.com

August 25
Washington State Fair
Puyallup, WA. Entry Deadline: 8/17/2013
www.thefair.com

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AHA/BJCP Sanctioned Competition Program

February 2013

Oxford Arts Alliance Homebrew Competition, 49 entries—Michael Broderick, Palmyra, PA.

KLCC Microbrew Festival Homebrew Competition, 179 entries—Randy Scorby, Baker City, OR.

The Bruery's Batch 1000 Competition, 199 entries—Brian Pramov/Bryan Keas, Denver, CO.

2013 Joint Base Lewis-McChord (JBLM) Homebrew Competition, 170 entries—Jody Payne, Tacoma, WA.

America's Finest City Homebrew Competition, 539 entries—Christian Banker, San Diego, CA.

Boston Homebrew Competition, 493 entries—Eric Adriaansen, Londonderry, NH.

2013 Reggale and Dredhop, 382 entries—Adam Kandle, Boulder, CO.

March 2013

The Coconut Cup, 281 entries—Allan Myers, Tampa, FL.

Bockfest Cincinnati 2013, 50 entries—Evan Rouse, Union, KY.

National Brewing Championships 2013, 329 entries—Chris Todd, Belfast, Ireland

Kona Brewers Festival 18th Annual Homebrew Competition, 297 entries—Brian Walls, Hilo, HI.

March Mashness, 182 entries—Mike Beuning, St. Cloud, MN.

Drunk Monk Challenge, 809 entries—Tim Thomsen, Lincoln, NE.

Slurp & Burp Open, 352 entries—Randy Scorby, Baker City, OR.

Shamrock Open, 400 entries—Brian Cox, Summerville, SC.

AHA Club-Only Competition Barleywine Ales, 52 entries—Nick Krause, Marengo, IL.

CBA(UK) Club Only Competition - Porters, 16 entries—London Amateur Brewers, London, England

Hoppy St. Patrick, 31 entries—Keith Wallis, Springfield, MO.

MiÁrcius sÍrforradalom, 144 entries—Róth Zoltán, Budapest, Hungary

World Cup of Beer, 522 entries—Paul Brown, Pinole, CA.

Hudson Valley Homebrew Competition, 309 entries—Mike Rich, Elmira, NY.

2013 Las Vegas Winterfest Competition, 171 entries—Jon Antonson, Las Vegas, NV.

Suwanee American Craft Beer Fest Competition, 200 entries—Tim Lewis, Roswell, GA.

Wine or Wort's 1st Annual Homebrew Competition, 20 entries—Jerod Day, Aspen, CO.

Texas Carboys Revers Pro/Am, 22 entries—Wyatt Shanks, Chris Sandhaus & Ken Fluhr, Cedar Park, TX.

Ultimate Brew-Off Homebrew Challenge, 69 entries—Peter Welton, Annapolis Valley, Nova Scotia, Canada

Amber Waves of Grain, 526 entries—Tim Collins, Grand Island, NY.

Sonoma Community Center's Beervana, 275 entries—Greg Rasmussen, Forestville, CA.

Peak-to-Peak Pro Am, 404 entries—James Frazer, Bedford, VA.

Belgian Beerfest, 37 entries—John Kingston, Melbourne, Victoria, Australia.

IBU Open, 333 entries—Chris Ford, Ankeny, IA.

Celebrewtional, 183 entries—Ian Elliot, Davis, CA.

Barley Legal 3, 274 entries—Kyle Laird, Somerdale, NJ.

Lonerider Brew-it-Forward V, 103 entries—Adam Reinke, Asheville, NC.

Bluebonnet Brew-off, 1478 entries—Lee Friske, Midland, TX.

SODZ British Beerfest, 151 entries—Frank Barickman, Delaware, OH.

22st Annual Charlie Orr Memorial Chicago Cup Challenge Homebrew Contest, 403 entries—Brett Semenske, Brookfield IL.

Ensenada Beer Fest, 61 entries—Eugenio Romero, Ensenada, Baja California, Mexico

20th Annual Peach State Brew Off, 430 entries—Ivano Harris, Atlanta, GA.

Great Lakes International Cider & Perry Competition, 438 entries—Wandering Angus Ciderworks, Salem, OR.

April 2013

Ocean State Homebrew Competition (OSHC), 359 entries—Dan Preston, Boston, MA.

Buzz HBC Iron Hill Pro-Am, 21 entries—Michael Cameron, Radnor, PA.

ALES Club Open, 379 entries—Jared Carlberg, Winnipeg, Manitoba, Canada

Champion of the Pint, 336 entries—Jeffrey Swearengen, Tulsa, OK.

The Thirsty Orange, 103 entries—Daniel Hillesheim, Knoxville, TN.

Bridging the Gap Pro Am, 159 entries—DWiGhT Mulcahy, San Antonio, TX.

Snow Goose Spring Break-Up Home Brew Comp, 20 entries—Imre Manyoky, Anchorage, AK.

Portland Cheers to Belgian Beers, 32 entries—Duke Greene, Vancouver, WA.

2013 SNAFU Club Only Brews Best Homebrew Championship, 4 entries—John Salerno, Henderson, NV.

Rimrock Brewer's Guild 4/20 Wheat Competition, 26 entries—Paul Pope, Billings, MT.

Between the Bluffs Beer and Cheese Festival, 77 entries—Dan Dahl, Minneapolis, MN.

South Shore Brewoff, 193 entries—Paul Zocco, Mansfield, MA.

Alamo City Cerveza Fest, 406 entries—Jeff Oberlin, Houston, TX.

Titletown Open XIX, 133 entries—Chris Schroeder, Kewaunee, WI.

Great Basin Brew Off, 233 entries—Jason Hobbs, Reno, NV.



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his Cascadian Dark Ale/Black IPA called Tuxedo Speedo (aka Morgan Freeman). Frazer, of the Labrewtory Homebrew Club, is looking forward to his trip to Colorado to brew with Bootstrap Brewing in Niwot. An all-grain brewer from day one, Frazer has only been brewing for about two years, but he was hooked from the very beginning.

"I got into brewing because a good friend of mine, Bryan Leavelle, started a blog about one-gallon, stovetop, all-grain brewing. I fell in love with the process and brewed three batches before I'd even tasted the first!" Frazer has racked up an impressive number of wins in his two-year brewing career, and has good advice for those looking to find competition success: brew to the same strict style guidelines that competition judges are trained to recognize.

"The key to brewing award-winning beer is to read the BJCP guidelines carefully," he says. "You can figure out your mash temperature, ingredients, what level to carbonate, and if the beer should be malt forward or hop driven. You can even figure out your hops schedule. So for me, it is important to follow the guidelines to create a beer for competition."

That does not mean one has to have the latest and greatest brewing equipment. Frazer has found plenty of success using low-tech equipment and techniques. "My 3.5-gallon brew system consists of a 4-gallon hot liquor tank, a 5-gallon Igloo mash tun with a stainless steel braid, and a 7-gallon kettle. I still boil on the electric kitchen stove, ferment at room temperature, and bottle condition." This lack of automation and clever gadgetry also cuts down on equipment failure and keeps his batch sizes low—he prefers to brew small, simple, and often. "If I have any brew day disasters, they all can be fixed without losing a batch or running to the hardware store. I like to keep it simple and take a hands-on approach, because I feel like I can control what I can do with the beer. I use a small system because it forces me to brew more often, and the less money I spend on gadgets, the more money I have for grain!"

His favorite style? "If I had to choose a style to drink for the rest of my life, it would be India pale ale."

For his Best of Show beer, Frazer waxes a bit poetic in his description, but it's hard not to get thirsty just reading about it. He explains, "It's a textbook Cascadian Dark Ale. The dankness of the Pacific Northwest hops is perfectly supported by a rich malty backbone and a hint of roast. That dankness comes back at you in the nose from the extensive dry hopping. This balance is not easy to achieve. After originally naming it Tuxedo Speedo, I changed the name of this beer because it reminds me of Morgan Freeman. It's badass, smooth, complex, intelligent, and gets along with everyone. Plus, I am a huge fan of 'Through the Wormhole.'"

And with that, let's get to the recipe.

Amahl Turczyn is associate editor for Zymurgy. He is a former professional brewer who now brews at home in Lafayette, Colo.



AHA SPECIAL EVENTS

Visit the Events section of HomebrewersAssociation.org for more information.

June 27

AHA National Homebrew Competition – Final Round
Philadelphia, PA

June 27-29

AHA National Homebrewers Conference
Philadelphia, PA

July 13

AHA Rally – Left Hand Brewing Co.
Longmont, CO

July 28

AHA Rally – Sweetwater Brewing Co.
Atlanta, GA

August 3
Mead Day

August 18
AHA Rally – Hardywood Park Craft Brewery
Richmond, VA

September 14

AHA Rally – 3 Stars Brewing Co.
Washington, D.C.

September 21

AHA Rally – Rochester Mills Production Brewery
Auburn Hills, MI

By Chris Bible

Hops, Tetra Hops, and Other Bittering Alternatives

As every homebrewer knows, great hops are a critical ingredient to making great beer. Hops have been used in the production of beer for many hundreds of years. The oils, aroma, and flavor compounds derived from hops are critical components in the flavor profile of modern beer.

The compounds derived from hops are responsible for:

- providing bittering compounds to beer
- providing hop-derived aroma and flavor to beer
- modifying yeast performance during fermentation
- enhancing the mouthfeel of beer
- protecting beer from some biological spoilage organisms
- contributing to protein coagulation during the boil
- improving head retention
- contributing tannins that may improve resistance to oxidation

All of these contributions are important, but providing bittering compounds to beer is, arguably, the most vital. Hops provide bittering compounds to beer through the extraction and isomerization of hop acids during the boiling process.

Hop Acids and Isomerization

The compounds associated with hop-derived bitterness within beer are the alpha-acids. These naturally-occurring alpha-acids exhibit poor solubility in water and have almost no bitter taste. When heat energy is applied to these molecules during the boil, the atoms within the alpha-acid molecules rearrange themselves (isomerize) by opening up and forming the cis- and trans-isomers known as iso-alpha-acids. The isomeriza-

tion reaction of alpha-acids to iso-alpha-acids is shown in Figure 1.

There are three different alpha-acids in hops. They are molecularly similar, but have different side-chain structures (the “-R” groups shown in Figure 1). Each of the three iso-alpha-acids exists in two different molecular forms (cis- and trans-), which differ in the orientation of the side chains relative to the rest of the molecular structure. These six iso-alpha-acids are responsible for hop-derived bitterness, and they each differ in the quality and intensity of their bitterness.



READER ADVISORY: Warning!

These pages are rated XG (eXtra Geeky) by the Bureau of Magazine Mucktymucks. Items in this section may contain raw data, graphic functions, full statistics and undiluted biochemistry. Keep away from poets, squeamish novices and others who may find the joyously technical nature of this prose to be mindbendingly conceptual or socially offensive. Also, because of the complex nature of brewing science, there is no guarantee that you will live longer, brew better or win any awards in the next homebrew competition based upon the conclusions presented here.

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Beer bitterness from hops is due to the presence of iso-alpha-acids in concentrations typically between 15 and 100 ppm within the beer.

Hop Bittering Options

Homebrewers typically use whole hops (loose leaf or in compacted plug form) or pelletized hops. Hops in either form will do a fine job if used properly, but each form has advantages and disadvantages to the brewer.

Whole hops tend to have a shorter shelf life than pelletized hops. They also tend to have a slightly lower alpha-acid utilization (typically 25 to 30 percent) than pellet hops during the boil. This is because the alpha-acid is more strongly bound up in

the vegetable matter of the leaf hop and therefore less readily available.

Pelletized hops are made by milling whole hops and then compressing the hops into pellets. Milling makes the alpha-acid more readily accessible, so pelletized hops tend to have a slightly higher utilization (typically 27 to 32 percent) than whole leaf hops. The pellets are packaged under vacuum or in nitrogen in order to minimize exposure to oxygen and reduce the rate of oxidation and deterioration of the hop oils. Pelletized hops are also available in an enriched pellet form, which has been further processed to remove some of the hop vegetable material. By removing non-alpha-acid-containing vegetable

FIGURE 1: ISOMERIZATION OF ALPHA-ACIDS TO ISO-ALPHA-ACIDS

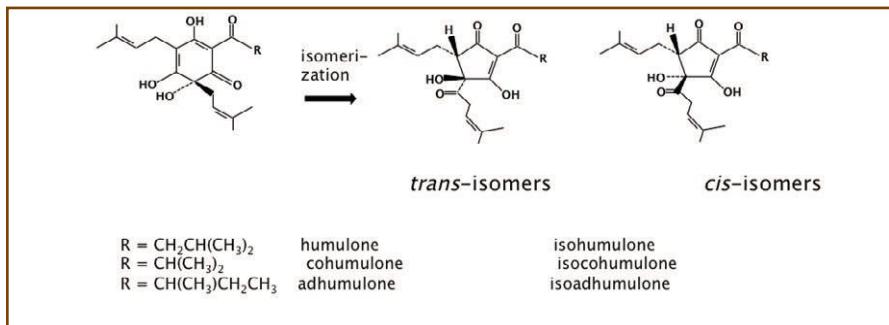


FIGURE 2: PHOTOCHEMICAL EFFECT OF LIGHT ON ISO-ALPHA-ACIDS IN BEER

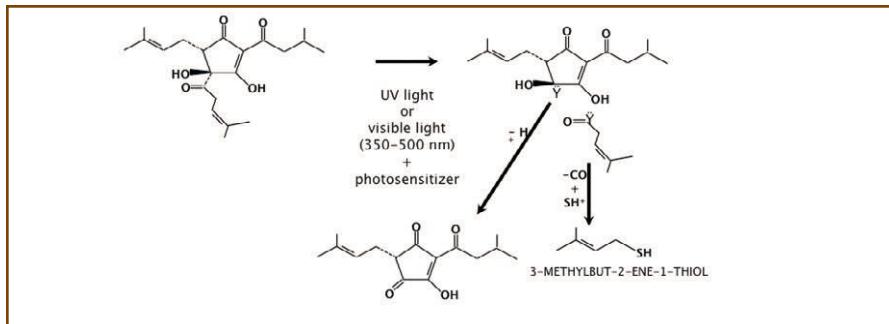
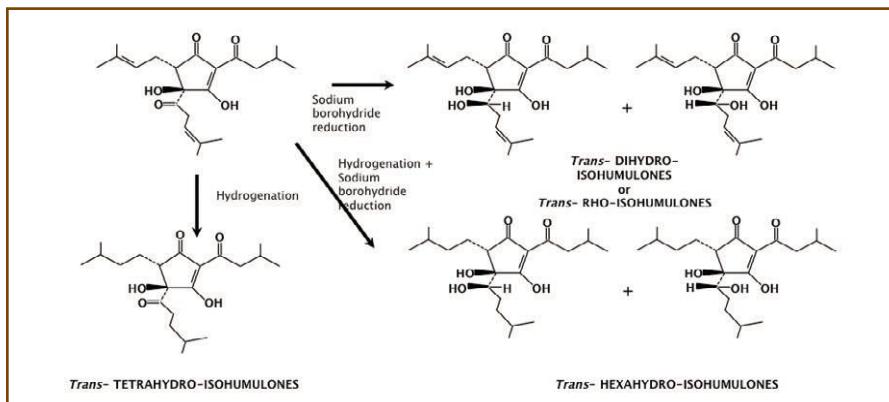


FIGURE 3: CHEMICAL REDUCTION OF ISO-ALPHA-ACIDS



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material, the amount of alpha-acid for a given amount of hops is increased.

Other forms of hops or hop-derived compounds that are less often used by homebrewers but are commercially available include isomerized hop pellets, hop extracts, isomerized hop extracts, reduced hop extracts (tetra hops), and hop essence.

Isomerized Hop Pellets

Isomerized hop pellets are milled in a way similar to standard pellets, but undergo additional processing in order to isomerize the alpha-acids within the hops. Isomerized hop pellets have magnesium oxide added as a stabilizer during the pelletizing process. The stabilized pellets are then packed in an inert atmosphere and heated to a temperature of about 50° C (122° F) for approximately 14 days. At the end of the 14-day heating period, up to 99 percent of the alpha-acids are isomerized within the hop. This allows wort utilization rates of 80-90 percent, and overall alpha-acid utilization rates of up to 70 percent.

Hop Extracts

Hop extracts are made by using organic solvents to solubilize and remove alpha and beta acids, hop oils, and hop resins from the hop vegetable matter. Organic solvents used in the extraction process include ethanol and hexane. Supercritical carbon dioxide may also be used as an extraction solvent. After extraction, the solvents are boiled off and a concentrated solution of hop oils and resins containing alpha-acids is left behind. The immediate availability of the alpha-acids in the extract results in increased overall utilization (typically 35 to 45 percent) during the boil.

Isomerized Hop Extracts: Kettle Addition and Post-Fermentation Addition

It is possible to improve utilization by pre-isomerizing the alpha-acid prior to boiling it in the wort. Heating alpha-acid in the presence of potassium or magnesium carbonate (K_2CO_3 and $MgCO_3$ respectively) is one way to achieve this isomerization. It produces a substance called pre-isomerized kettle extract. If the pre-isomerized kettle hop extract is added to the boiling kettle, one can commonly

achieve an overall utilization of approximately 70 percent.

Pre-isomerized hop extract added to the boiling kettle will incur overall utilization losses due to absorption of the iso-alpha-acid by hot break material in the boiling kettle, and also by the trub and yeast during

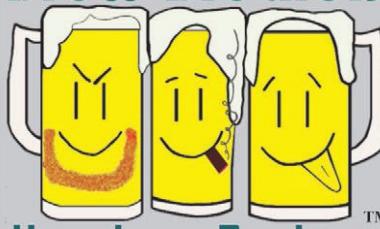
fermentation. It is also possible to add pre-isomerized hop extract to a beer after fermentation is complete. The isomerized extract used for post-fermentation addition is typically a standard solution of 20 or 30 percent iso-alpha-acid by weight. When using pre-isomerized hop extract in this way, brewers can expect an overall

TABLE I: COMPARISON OF BITTERING PROPERTIES

| Compounds | Relative Bitterness |
|-------------------------|---------------------|
| Isohumulones | 1.0 |
| Dihydro-isohumulones | 0.6-0.7 |
| Tetrahydro-isohumulones | 1.5-1.9 |
| Hexahydro-isohumulones | 1.0-1.2 |



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utilization of 70 to 95 percent or greater. Commercial brewing operations sometimes use post-fermentation additions of pre-isomerized hop extracts to adjust the final bitterness level of a beer, or to increase the bitterness level in a high-gravity beer by compensating for poor utilization due to high gravity.

Isomerized extracts intended for post-fermentation use contain only iso-alpha-acids and contribute no hop flavor or aroma character to the beer. They contribute only bitterness. When a post-fermentation addition of pre-isomerized hop extract is used as the only source of beer bitterness, base extract should also be

used in order to provide the other organoleptic qualities associated with hops.

Reduced Hop Extract (Dihydro, Tetrahydro, and Hexahydro Isohumulones)

When ultraviolet (UV) or visible light in the presence of an appropriate photosensitizer hits beer, it provides the energy necessary to drive a chemical reaction that transforms the hop-derived iso-alpha-acids into 3-methylbut-2-ene-1-thiol (see Figure 2).

The “thiol” part of the name in the 3-methylbut-2-ene-1-thiol compound indicates that there is sulfur present. Sulfur compounds often have strong, offensive aromas. The flavor threshold of 3-methylbut-2-ene-1-thiol in beer is so low that the presence of only a few parts per billion is enough to irreversibly spoil the beer and impart characteristic “skunk” or “light-struck” flavors and odors.

Beer can be completely protected from the effects of light by storing it in opaque containers such as cans or kegs. Beer that is packaged and stored in bottles, however, is susceptible to developing the skunky off flavors and aromas associated with 3-methylbut-2-ene-1-thiol.

The sensitivity of beer to UV light can also be reduced by chemically altering the iso-alpha-acids so that the chemical precursor to the photochemical reaction responsible for producing the “skunk” flavor is not present within the beer.

Iso-alpha-acids can be converted to reduced iso-alpha-acids by hydrogenation and/or by reaction with sodium borohydride. Three major types of reduced iso-alpha-acids can be produced: dihydro, tetrahydro, and hexahydro. Figure 3 shows the reactions.

Although the chemically reduced iso-alpha-acids are still as photo-reactive as the ordinary iso-alpha-acids, 3-methylbut-2-ene-1-thiol cannot be formed from these compounds. As a result, the light-struck flavor that may be developed from reduced iso-alpha-acids has a much less obnoxious taste and aroma than the light-struck flavor resulting from photo-cleavage of the ordi-

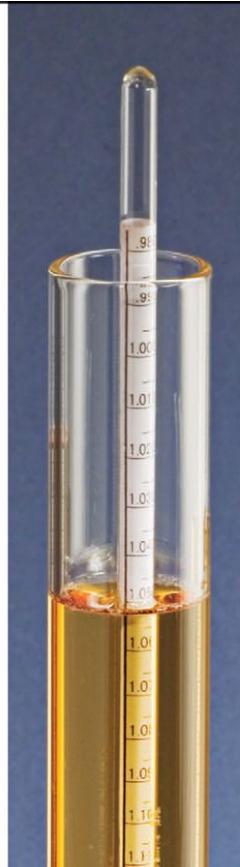
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nary iso-alpha-acids. Substitution of iso-alpha-acids by dihydro, tetrahydro, and hexahydro-iso-alpha-acids allows brewing of light-stable beers, which can be bottled in clear or green glass. Additionally, the bittering properties of dihydro, tetrahydro, and hexahydro-iso-alpha-acids are comparable to that of ordinary iso-alpha-acids as shown in Table 1.

Hop Essence

Most of the hop-derived substances considered so far have been used to enhance the bitterness of beer through contribution of iso-alpha-acid. Hops are also a source of hop oil, flavor, and aroma compounds.

The compounds associated with hop aroma can be separated by steam distillation or by supercritical CO₂ extraction and captured to produce "hop essence" oils. These hop oils are ideal for post-fermentation additions where they can provide a dry-hopped aroma to beer, and also provide much of the aroma character associated with the original hop variety. Commercial breweries usually add the hop-essence oils in the form of an emulsion (with a food grade emulsifier). The hop-essence oils are usually marketed in concentrations between 1,000 and 10,000 ppm (0.1 to 1 percent by weight) of pure oil.

With column chromatography, it is possible to fractionate the whole hop oil into late hop essence, which may be further divided into spicy and floral fractions. Spicy late-hop-essence oils contain terpene and sesquiterpene oxides. These compounds produce a spicy flavor in beer, improve mouthfeel, and enhance perceived bitterness. Floral late-hop-essence oils contain ketones, which impart light floral notes and improve the fragrance of the beer.

Conclusions

The use of commercially available alternatives to whole hops or pelletized hops is becoming increasingly common among homebrewers. Pre-isomerized hop products, hop essences, hop extracts, and tetra hops are all possibilities. Although there are many different ways to achieve a desired bitterness level and hop flavor/aroma character within a beer, each alternative has pros and cons that must be considered on a case-by-case basis.

Chris Bible is a chemical engineer whose love of beer and science intersected when he became a homebrewer over 12 years ago. He resides in Knoxville, Tenn. with his wife and son and especially enjoys brewing porters and stouts.

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ON THE WEB

Flying Dog Brewery
www.flyingdogbrewery.com

New Belgium Brewing Co.
www.newbelgium.com

BJCP Style Guidelines
www.bjcp.org

Commercial Calibration
HomebrewersAssociation.org/pages/zymurgy/commercial-calibration
(Note: This is a Members Only area of the website)

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 widely available commercial beers (or meads or ciders) using the BJCP scoresheet. We invite you to download your own scoresheets at www.bjcp.org, pick up a bottle of each of the beverages and judge along with them in our Commercial Calibration.

For a change of pace, and to give their palates a new test, we decided to send our judges two imperial IPAs using some of the newer hop varieties.

First up was a brand new year-round beer from New Belgium Brewing Co. in Fort Collins, Colo. Rampant Imperial IPA is brewed with Mosaic and Calypso hops, with the addition of Centennial hops for a well-rounded aroma.

“Imperial IPAs take hoppy beers to the next level,” said New Belgium assistant brewmaster Grady Hull. “Rampant packs a powerful wallop but it’s got the malt bill to back it up.”

Mosaic, formerly known as experimental hop HBC 269, was developed by the Hop Breeding Company, LLC and released in 2012. A daughter of Simcoe, Mosaic is known for its “unique and complex blend of floral, tropical, fruity, and earthy characteristics,” including mango, lemon, pine, and blueberry.

Calypso, known as 03129, originated from a cross between a Hopsteiner breeding female and a Hopsteiner male derived from Nugget. Hopsteiner said Calypso hops provide notes of pear and apple.

Rampant is 8.5 percent ABV and 85 IBU. It’s available in 12-ounce and 22-ounce bottles and on draft in most New Belgium markets.

Next up was El Dorado Imperial IPA, from the Single Hop series from Flying Dog Brewery in Frederick, Md. The brewery is releasing a different single hop impe-

rial IPA each quarter in 2013, leading off with El Dorado, which was available from January through April. (Subsequent installments will include Citra, Sorachi Ace, and Simcoe). Flying Dog plans to release the El Dorado imperial IPA again in 2014, said spokesperson Erin Weston.

The El Dorado hop was developed by CLS Farms LLC in 2008 and was released in 2010. El Dorado is known for its fruity notes, specifically tropical fruit. Other notes detected include pear, watermelon, and stone fruit. Stan Hieronymus, author of *For the Love of Hops*, has likened the aroma to Life Savers candy, specifically cherry. Judge Gordon Strong noted the beer’s “big fruity nose, oddly reminiscent of hard candies.”

Flying Dog suggests that El Dorado Imperial IPA, which checks in at 10 percent ABV and 70 IBU, should be paired with fruits like pineapple and starfruit; sharp cheddar cheese; and Thai, Mexican, curry, and wasabi spiced dishes.

OUR EXPERT PANEL includes David Houseman, a Grand Master IV judge and competition director for the BJCP from Chester Springs, Pa.; Beth Zangari, a Grand Master level judge from Placerville, Calif. and founding member of Hangtown Association of Zymurgy Enthusiasts (H.A.Z.E.); 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 VII judge, principal author of the 2004 BJCP Style Guidelines and president of the BJCP board who lives in Beavercreek, Ohio.



THE JUDGES' SCORES FOR RAMPANT IMPERIAL INDIA PALE ALE



Aroma: High, complex citrus and earthy hop aromas. Alcohol noticeable. Fruity esters with some stone fruit notes. Undistinguishable malt in the background. Hoppy but balanced aroma. No DMS or diacetyl. (10/12)

Appearance: Gold color. Clear, but with some lingering haze. Big white, rocky, long-lasting head. (3/3)

Flavor: High earthy and citrus hop flavor with a good deal of pale malt backbone. Earthy character is distracting. Stone fruit fermentation esters. No DMS or diacetyl. Lingering high hop bitterness with a dry finish. Alcohol noticeable but not overly assertive. (15/20)

Mouthfeel: Moderate carbonation. Medium body. Moderate alcohol warming. Some hop astringency along with the lingering bitterness in mouthfeel. (4/5)

Overall Impression: Citrus notes offset by the earthiness, together contributing to complexity. This beer would be brighter without the earthiness, but it would also give up a unique character as well. Overall balance (hops, malts, and alcohol) is a plus. Another beer to have with spicy curries or hot Buffalo wings to cut the heat. (8/10)

Total Score: (40/50)

Aroma: Immediately on popping the bottle cap, a blast of orange zest, white pine, and herbal, woodsy hop aroma hits the nose. Citrus changes to Meyer lemons and pink grapefruit, followed with ripe peach esters and a rich, though subtle, caramel malt. (10/12)

Appearance: Golden yellow colored liquid is brilliantly clear, topped with an off-white biscuity, persistent layer of foam. (3/3)

Flavor: Moderate level of caramel and lightly toasted malt gives way to a low peach note. An assertive hop flavor of Meyer lemon and herbal woodiness emerges into a hop bitterness as assertive as that of a hop pellet directly on the tongue (yes, I tried that once during my first brewing class). In the immediate finish, this intense hop flavor melange and bitterness change to peach seasoned with lemon accented with a note of malty sweetness. (18/20)

Mouthfeel: Medium-full bodied with creamy, almost silky carbonation that insulates a firm, cozy alcohol warmth. A surprisingly dry, not astringent, finish coupled with the herbal hop character makes for a tingling sensation on the lips. The post finish is reminiscent of a good whiskey, or a hop tincture—warming, inviting, comforting, relaxing. (5/5)

Overall Impression: That hop aroma on opening of the bottle worried me at first that the beer would be either all flavor or all bitterness. However, the malt beast of burden delivered a lovely balance of flavor, bitterness, toasty light caramel, light peachy esters—all with a garnish of sweet malt and fruity floral lemon. (9/10)

Total Score: (45/50)

Aroma: Earthy, woody, and mineral notes flow out as the beer is pouring. I get resinous notes from fresh-cut wood and something akin to juniper berries. Some grapefruit character, but the hops are more forest-like than citrusy. The malt lends some sweetness along with caramel and toasted notes to support the tapestry of hops. Alcohol and low levels of tropical fruit esters add complexity. The beer is hop-focused, but in balance. (10/12)

Appearance: Light copper color with a white head that lasts well. The clarity is pristine. (3/3)

Flavor: The hops permeate throughout, lending the earthy, nutty, and woody notes found in the aroma. This is a nice change from the typical grassy and citrus notes found in most IPAs. The bitterness is fairly intense and lingers, although there is enough malt character and backbone to maintain the balance. The fermentation esters are moderate in strength with tropical fruit notes including mango and pineapple. (15/20)

Mouthfeel: The conditioning is good, with enough carbonation to express the aromatics. The alcoholic warmth is medium and the astringency is low, both in range for the style. The caramel malt is perhaps a little too cloying, diminishing the crispness of the finish. (4/5)

Overall Impression: A very nice brew and a good tutorial in some lesser-known hops. The resinous, cut wood, and green grass characters add complexity but are not overpowering thanks to a well-designed malt backbone. There is enough fermentation character to keep it from being one-dimensional. (8/10)

Total Score: (41/50)

Aroma: Strong, resin-fresh piney hops, like freshly cut evergreen boughs. Mild citrusy undertone but woody, piney qualities dominate. Some hot alcohol noted. Malt is subdued, hardly noticeable. Fresh hop aroma has a green, raw character. The freshness of the hops accentuates the resinous qualities. I kept thinking "forest-like." (9/12)

Appearance: Some haze. Medium gold color. Tall cream-colored head, persisted well. (2/3)

Flavor: Woody, herbal, resin hops initially with an orange-tangerine-mango flavor following. Substantial malt presence masks some of the bitterness. The malt is neutral in flavor, maybe with a light malty sweetness impression, but it seems like it's overwhelming the hops on the palate. The finish is full and heavy, with pungent hops and some harsh bitterness coming out in the aftertaste. The citrusy esters play well with the malt but the hops have a huge, resin overture that dominates. (15/20)

Mouthfeel: Thick-tasting, full body, heavy in the mouth, almost viscous. Fairly astringent from the hops. Medium-high carbonation. Warming/hot alcohol. (3/5)

Overall Impression: A heavy-tasting beer—not readily apparent as an IPA due to the heavy body and thick finish. IBUs are swallowed by the malt, and only seem apparent in the aftertaste. Strong piney flavor with citrusy-orange-mango accents is very interesting. The hot alcohol and resin hops do make it seem quite pungent, and hit the palate hard. Very fresh hop notes. Not sweet—just malty/heavy. A tasty combination, a bit too piney/herbal for my taste but an interesting blend nonetheless. (7/10)

Total Score: (36/50)

THE SCORES



El Dorado Imperial IPA—Flying Dog Brewery, Frederick, Md.
BJCP Category: 14C Imperial IPA

THE JUDGES' SCORES FOR EL DORADO IMPERIAL IPA



Aroma: Bold hop aroma at forefront with pine and citrus dominating. Noticeable high alcohol. Supporting spicy-malt backbone. Fruity lemon and apricot esters. No diacetyl. No DMS. (10/12)

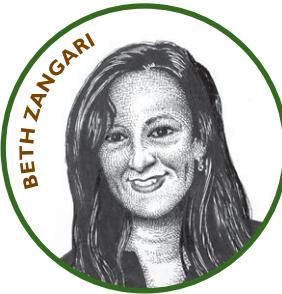
Appearance: Dark gold color. Dense, rocky, white, very long-lasting head. Clear with light haze. (3/3)

Flavor: High citrus and piney hop aroma. Lemon and apricot esters. Sweet malt with light spiciness and a very high hop bitterness and alcohol presence. Alcohol is hot, harsh. A bit of medicinal character comes through. No DMS. No diacetyl. Nice complexity. (16/20)

Mouthfeel: Well-carbonated. Soft initial palate. Medium body. Lingering bitterness but little to no astringency. Alcohol warming. Fully attenuated, dry finish. (4/5)

Overall Impression: A very nice single hop imperial IPA that matched the piney/citrus hop character with spicy-sweet maltiness. Alcohol is hot; perhaps this beer is young. This may age out, so lay down a case now to enjoy next winter. Very good with spicy foods like Thai and Indian curries. (7/10)

Total Score: (40/50)



Aroma: Light stone fruit initially, plays among peach, cherry, and pineapple, with significant rich caramel maltiness. Fruity floral hop aroma is subdued, reminds me of clover flowers in quality and delicacy. A hint of pine emerges with a swirl, but quickly retreats. Alcohol is evident. (8/12)

Appearance: Golden, brilliantly clear with a fine creamy thin layer of foam that persists. The foam laces on the glass, while the liquid leaves legs. (3/3)

Flavor: Rich caramel malt with hint of spicy fruit dominates the first impression, then gives way to substantial hop bitterness, but still allows a mild, tree-ripened peach and Bing cherry fruitiness to shine through, adding depth and complexity. The assertive bitterness hits upside the palate, with just a hint of pine flavor. Balance is decidedly toward hops, though presentation is a bitterness that lingers intriguingly long into the finish and post finish. (15/20)

Mouthfeel: Medium-full bodied with a moderate, creamy textured carbonation. Significant alcohol warmth combines with the hop character for a slightly numbing, tingling sensation. (5/5)

Overall Impression: The 70 IBUs promised on the label were certainly apparent, well supported by a firm malt backbone and carried by the creamy texture. Malt and rye as the fruity, spicy note dominated the first impression where I was looking for a more brilliant citrus and evergreen aroma and flavor. The significant bitterness without the flavor and aroma hints at a delicate hop variety, which, while assertive and brash, may fade quickly. Delightful to sip, and grows on the palate. (8/10)

Total Score: (39/50)



Aroma: Hops are present but a little understated compared to most American IPAs. Woody and leafy notes, with a subtle tobacco-like character. The tropical fruit esters and alcohols are more prevalent and speak to the potency of this beer, at an assertive 10 percent. Some caramel malt, but the focus is on yeast aromatics. This beer seems like a hybrid of the English and American IPA styles. (8/12)

Appearance: Nothing to fault here. It has a soft golden color with a tight white head that lasts longer than in most high alcohol beers. The clarity is excellent. (3/3)

Flavor: An initial push of malt that slowly fades to an assertive hop bitterness with the earthy, grassy, and woody notes of El Dorado hops peaking in the middle. I also pick up some lemony notes. The malt has caramel and toasted components and provides a nice backbone. Pear and mango esters add complexity and are more in balance in the flavor than the aroma. (16/20)

Mouthfeel: The carbonation level is medium and appropriate for style, adding some creaminess. The alcohol is a little on the hot side, with some esters and higher alcohols contributing solvent-like notes. Low astringency. (3/5)

Overall Impression: A solid beer that would perhaps be better labeled as a Double IPA—maybe Doubloon IPA in view of the El Dorado hops? The fermentation character in the aroma dominates the hop character and does not let the single hop variety fully express itself. Overall, a successful and interesting exhibition of the El Dorado hop. (8/10)

Total Score: (38/50)



Aroma: Big fruity nose, oddly reminiscent of hard candies—lemon, lime, strawberry, cherry—fruit punch. Grassy-fresh hop notes follow. Light sweetness and alcohol noted. Neutral malt character, hardly noticeable. Lots of fruit, with a little piney accent. Quite unusual and interesting. Very clean. (10/12)

Appearance: Very clear. Tall, frothy, off-white head that retained well. Medium-gold color. (3/3)

Flavor: Fruity, with a squishy stone fruit and peach character along with a bit of citrus. Some ethanol detracts. Herbal, grassy freshness to the hop character. Apricot, pear, and apple flavors build over time. The esters are complex and changing—keeping your interest. Firm bitterness slightly offset by a light malty sweetness. Very light caramel-honey flavor. Stone fruit and grassy notes persist. Bitter aftertaste but the malt softens the blow. (16/20)

Mouthfeel: Medium body, at least. Seems a touch heavy. Medium carbonation. Warming alcohol, becoming hot in the aftertaste. Not harsh or astringent, though. (4/5)

Overall Impression: Many different fruit flavors and aromas. Malt does a decent job staying out of the way but could be a little drier and lighter in the body. Fruit flavors play with the caramel and honey notes to give an interesting and appealing impression. Fairly well balanced but less malt would improve drinkability. Very clean flavor, just a bit heavy/big. Does this need to be a 10 percent beer? I keep thinking that a lower OG and ABV would dry it out more and make it easier to drink. (8/10)

Total Score: (41/50)

by Charlie Papazian



The Americanization of Beer Styles



Several unique and distinctive beer styles have emerged over the past 70 years in the United States. American-style light lager, with its low-calorie and colored derivations, has been the most copied and popularized throughout the world. These beers are defined by their high corn, rice, and sugar adjunct content, low malt and hop taste profiles, and “refreshing” higher carbonation. Their presence has been both dominating and ubiquitous. But times are changing.

Over the past 30 years, innovative craft brewers in the United States have created many beer types that at the time defied categorization as European styles. The popularity of these “American-style” beers has grown both in the U.S. and internationally. What has defined these styles and why did they emerge? Here are a few select examples of how both culture and access to ingredients helped to define new directions in beer character.

Art © Shutterstock

Magic Place India Pale Ale

ALL GRAIN RECIPE

INGREDIENTS

for 5.25 U.S. gallons (20 liters)

| | |
|-----------------|--|
| 9.5 lb | (4.3 kg) Maris Otter two-row English malt |
| 12.0 oz | (340 g) English crystal malt (10° L) |
| 4.0 oz | (113 g) Belgian Special B malt |
| 4.0 oz | (113 g) Brazilian dark rapadura sugar or other dark/amber sugar |
| 1.0 oz | (28 g) Centennial hops, 12% a.a. (12 HBU/336 MBU) 60 min |
| 1.0 oz | (28 g) Cascade hops, 6% a.a. (6 HBU/168 MBU) 20 min (flavor) |
| 1.0 oz | (28 g) Centennial hops, 12% a.a. (14 HBU/168 MBU) 20 min (flavor) |
| 1.0 oz | (28 g) Cascade hops, 6% a.a., 2 min, (boiling flavor/aroma) |
| 0.5 oz | (14 g) Centennial hop pellets, dry hop |
| 0.25 tsp | (1 g) powdered Irish moss American or English ale type yeast |
| 0.75 cup | (175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging |

Target Original Gravity: 1.057 (14 B)

Target Extraction Efficiency: 75%

Approximate Final Gravity: 1.015 (3.8 B)

IBUs: about 70 as calculated

Approximate Color: 14 SRM (28 EBC)

Alcohol: 5.5 percent by volume

DIRECTIONS

A step infusion mash is employed to mash the grains. Add 10.5 quarts (10 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 5.25 quarts (5 l) of boiling water and add heat to bring temperature up to 155° F (68° C) and hold for about 30 minutes. Raise temperature to 167° F (75° C), lauter and sparge with 3.5 gallons (13.25 l) of 170° F (77° C) water. Collect about 5.5 gallons (21 l) of runoff. Add 60-minute hops and rapadura sugar and bring to a full and vigorous boil.

The total boil time will be 60 minutes. When 20 minutes remain, add the 20-minute hops. When 10 minutes remain, add the Irish moss. When two minutes remain, add the two-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. Strain and sparge the wort into a sanitized fermenter. Bring the total volume to 5.25 gallons (20 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). Ferment at about 70° F (21° C) for about one week or when fermentation shows signs of calm and stopping. Rack from your primary to a secondary and add the hop pellets for dry hopping. If you have the capability, “cellar” the beer at about 55° F (12.5° C) for about one week. Prime with sugar and bottle or keg when complete.

Magic Place India Pale Ale

MALT EXTRACT RECIPE

INGREDIENTS

for 5.25 U.S. gallons (20 liters)

| | |
|-----------------|---|
| 7.1 lb | (3.2 kg) very light malt extract syrup or 5.75 lb (2.6 kg) very light DRIED malt extract |
| 12.0 oz | (340 g) English crystal malt (10° L) |
| 4.0 oz | (113 g) Belgian Special B malt |
| 4.0 oz | (113 g) Brazilian dark rapadura sugar or other dark/amber sugar |
| 1.25 oz | (35 g) Centennial hops, 12% a.a. (15 HBU/420 MBU) 60 min |
| 1.0 oz | (28 g) Cascade hops, 6% a.a. (6 HBU/168 MBU) 20 min (flavor) |
| 1.0 oz | (28 g) Centennial hops, 12% a.a. (14 HBU/168 MBU) 20 min (flavor) |
| 1.0 oz | (28 g) Cascade hops, 6% a.a., 2 min (boiling flavor/aroma) |
| 0.5 oz | (14 g) Centennial hop pellets, dry hop |
| 0.25 tsp | (1 g) powdered Irish moss |
| | American or English ale type yeast |
| 0.75 cup | (175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging |

Target Original Gravity: 1.057 (14 B)

Target Extraction Efficiency: 75%

Approximate Final Gravity: 1.015 (3.8 B)

IBUs: about 70 as calculated

Approximate Color: 14 SRM (28 EBC)

Alcohol: 5.5 percent by volume

DIRECTIONS

Place crushed grains in 2 gallons (7.6 liters) of 150° F (66° C) water and let steep for 30 minutes. Strain out (and rinse with 3 quarts (2.8 L) hot water) and discard the crushed grains, reserving the approximately 2.5 gallons (9.5 L) of liquid to which you will now add malt extract, rapadura sugar, and 60 minute hops. Bring to a boil.

The total boil time will be 60 minutes. When 20 minutes remain, add the 20-minute hops. When 10 minutes remain, add the Irish moss. When two minutes remain, add the two-minute hops. The total boil time will be 60 minutes. After a total wort boil of 60 minutes, turn off the heat.

Immerse the covered pot of wort in a cold water bath and let sit for 15-30 minutes or the time it takes to have a couple of homebrews. Strain out and sparge hops and direct the hot wort into a sanitized fermenter to which 2.5 gallons (9.5 liters) of cold water has been added. If necessary add cold water to achieve a 5.25-gallon (20-liter) batch size. Aerate the wort very well.

Pitch the yeast when temperature of wort is about 70° F (21° C). Ferment at about 70° F (21° C) for about one week or when fermentation shows signs of calm and stopping. Rack from your primary to a secondary and add the hop pellets for dry hopping. If you have the capability, "cellar" the beer at about 55° F (12.5° C) for about one week. Prime with sugar and bottle or keg when complete.

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Let's first take a look at some of the earliest manifestations of contemporary American styles of beer. It all began with the emergence of **American-style pale ale**. In the 1970s, American homebrewers were just beginning to discover different beer characters than those found in American light lager. Homebrewers were using hops with a heavy hand and were pleased with the resulting flavors, aroma, and bitterness. While English-style pale ales were the inspiration, Cascade hops were the only American hop available to homebrewers in the early days. The unique quality of American-style pale ale was born.

Ales brewed with American citrus-like hops such as Cascade, Centennial, Chinook, Nugget, and other hops

uniquely "American" found their way into stouts, strong ales, amber ales, brown ales, and more. **American-style stouts** and **porters** were originally modeled after their Irish and British counterparts, but with the addition of citrus and fruity American hops, a clear distinction emerged between Old World and New World styles.

American-style brown ale was the homebrewer's answer to brewing a copycat version of the only known style of brown ale available at the time: Newcastle Brown Ale. American homebrewers enjoyed the smooth, nutty, caramel, and gently hop-balanced ale brewed by the then-independent Scottish & Newcastle Brewery. But homebrewers found that their heavy-handed doses of American hops produced a brown ale that was not only much more bitter but also had nuances of American hop flavor and aroma. While they enjoyed Newcastle, they fell in love with hoppy brown ales. What to call this new type of ale? They were being brewed by American homebrewers everywhere, but I recall Texas homebrewers wanting to lay their claim on this new style, calling it Texas-style brown ale. Their campaign did not prevail. American-style brown ale persisted. At the time, no other worldly beer type came close to resembling this hoppy brown ale.

As American craft brewers thrived, American pale ales were becoming stronger and more colorful. **American-style strong pale ale**, **India pale ale**, **amber/red ale**, **imperial/double red ale**, **barley wine ale**, **stout**, **imperial stout**, **porter**, and **imperial porter** all reflected elevated and sometimes extreme doses of flavor, aroma, and bitterness from signature varieties of American hops. They created flavors never before experienced in the world of beer.

The emergence of **American-style wheat beer** also has an interesting story. American homebrewers and early American microbrewers traveled to Germany and enjoyed German-style hefeweizen. In fact, they loved it with a passion. They brought their enthusiasm back to the U.S., only to find one important ingredient missing: German wheat beer yeast. Of course

it was available, but at great cost and effort, so American homebrewers and microbrewers put all the ingredients and process together using either American or English ale yeast. The fruitiness of wheat malt and the flavors of cloudy, suspended English/American ale yeasts created a well-received and enjoyable beer. Another style was born.

Though there is not a specific style called "**American-style fruit beer**," this type of beer was also born because of excitement

for Belgian fruit lambic and gueuze beers. Having sampled imported versions of these very specialized styles of Belgian ales, American homebrewers and microbrewers began adding fruit to their beers, but without using the lambic process or the microorganisms that would create true lambic-type beers. The infusion of fruit into many beer types soon became popular.

American-style wheat wine is another unique style born of innovation. If we could have barleywine, why couldn't we

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make wheat wine? Using 100-percent wheat malt in beer presents many challenges, but that did not stop American brewers from pursuing the idea. An American classic was born.

In the recent decade of brewing, other ideas have emerged amongst American homebrewers and small and independent craft brewers. The use of fresh, "wet" hops at harvest time has become the focus of a seasonal beer style celebrating hops as a special agricultural ingredient,

much as Beaujolais Nouveau celebrates the grape harvest in the wine world. These beers are called **fresh "wet" hop harvest ales**.

American-style Pilsener represents the classic and unique pre-Prohibition Pilsener, a flavorful pale lager with both a malt and hop presence. It is made with up to 25 percent corn and/or rice, enhancing the hop and malt character. The use of Old World flavor and aroma hops (called noble-type hops) is preferred.

The cross fertilization of Belgian and American beers has created some innovative beer types, including:

American-Belgo-style ales: These beers are either 1) non-Belgian beer types portraying the unique characters imparted by yeasts typically used in fruity and big Belgian-style ales or 2) defined Belgian-style beers portraying the unique character of American hops. These are unique beers unto themselves.

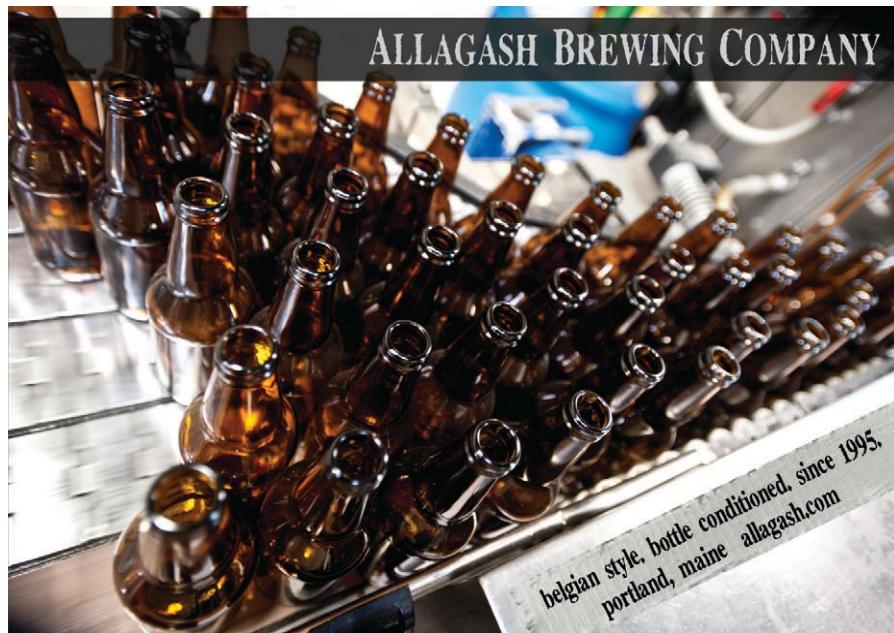
American-style Brett beer: These beers express an evolution of natural acidity developed by *Brettanomyces* varieties of yeast. They have a balanced complexity. Horsey, goaty, leathery, phenolic, and light to moderate and/or fruity acidic character evolved from *Brettanomyces* organisms may be evident, not dominant, and in balance with other character.

American-style sour ales: These beers may have a full range of hop aroma and hop bitterness intensities, and a full range of body. There is no *Brettanomyces* character in this style of beer. The acidity present is usually in the form of lactic, acetic, and other organic acids naturally developed with acidified malt in the mash or in fermentation by the use of various microorganisms including certain bacteria and yeasts. Acidic character can be a complex balance of several types of acid and characteristics of age. These beers are distinct from the classic red/brown Belgian-style sour ales, lambics, and Berliner weisse.

The future promises continued innovation not only in the U.S. but elsewhere in the international beer scene. It's a good time to be a beer drinker! As a tribute to our craft beer heritage, here's a simple "hybrid" IPA that's an English-style 5.5 percent alcohol by volume, yet hopped as an American style. Its fuller body makes for a balanced deliciousness that's sessionable.

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

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

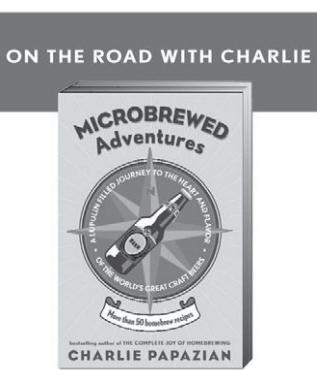


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ADVERTISERS INDEX

| | | | | | |
|---|---------|---|---------|--|--------|
| 1-2-1 Marketing Services Group Inc..... | 23 | Odell Brewing Company..... | Cover 2 | Shmaltz Brewing Company..... | 56, 60 |
| www.121msg.com | | www.odellbrewing.com | | www.shmaltzbrewing.com | |
| Allagash Brewing Company..... | 70 | Pacific Merchants dba Krome Dispense..... | 15 | Sierra Nevada Brewing Co. | 12 |
| www.allagash.com | | www.kromedispense.com | | www.sierranevada.com | |
| American Homebrewers Association..... | 52, 62 | Polar Ware..... | 11 | South College - Knoxville | 10 |
| www.HomebrewersAssociation.org | | www.polarware.com | | www.SouthCollegeTN.edu | |
| Bayhawk Ales..... | 61 | Quality Wine and Ale Supply..... | 53 | St. Louis Wine & Beermaking..... | 16 |
| www.bayhawkales.com | | www.HomeBrewIt.com | | www.wineandbeermaking.com | |
| Bier Meister..... | 1 | Quoin Industrial (Party Pig)..... | 51 | Support Your Local Brewery | 68 |
| www.BeerMeisters.com | | www.partypig.com | | www.CraftBeer.com/SYLB | |
| Blichmann Engineering..... | 47 | Rebel Brewer..... | 53, 69 | White Labs, Inc. Pure Yeast & Fermentation | 37 |
| www.BlichmannEngineering.com | | www.rebelbrewer.com | | www.WhiteLabs.com | |
| Boulevard Brewing Company..... | 14 | SABCO (div. of Kegs.com Ltd.)..... | 16 | William's Brewing | 62 |
| www.boulevard.com | | www.Kegs.com | | www.williamsbrewing.com | |
| Brew Brothers Homebrew Products, LLC | 61 | Samuel Adams | 39 | Wyeast Laboratories Inc. | 21 |
| www.brewbrothers.biz | | www.samueladams.com | | www.wyeastlab.com | |
| Brewers Publications..... | 52, 54 | Seven Bridges Cooperative | 23 | | |
| www.BrewersPublications.com | | www.breworganic.com | | | |
| Briess Malt & Ingredients Company..... | 31 | | | | |
| www.brewingwithbriess.com | | | | | |
| BSG Handcraft | Cover 4 | | | | |
| www.bsghandcraft.com | | | | | |
| Cicerone Certification Program..... | 38 | | | | |
| www.cicerone.org | | | | | |
| Country Malt Group | Cover 3 | | | | |
| www.countrymaltgroup.com | | | | | |
| Country Wines / South Hills Brewing Supply | 44 | | | | |
| www.countrywines.com; | | | | | |
| www.southhillsbrewing.com | | | | | |
| Dallas Homebrew - A division of Fine Vine Wines | 60 | | | | |
| www.DallasHomeBrew.com | | | | | |
| Danstar..... | 6 | | | | |
| www.Danstar.com | | | | | |
| Deep Wood Brew Products, LLC | 17 | | | | |
| www.dwbrewproducts.com | | | | | |
| Emerson Climate Technologies..... | 71 | | | | |
| www.controlproductsonline.com/brewer | | | | | |
| Five Star Chemicals & Supply, Inc. | 58 | | | | |
| www.fivestarchemicals.com | | | | | |
| Grandstand Glassware • Apparel • Promotional Items ... | 35 | | | | |
| www.ergrandstand.com | | | | | |
| Grape and Granary, The | 30 | | | | |
| www.grapeandgranary.com | | | | | |
| Great American Beer Festival® | 63 | | | | |
| www.GreatAmericanBeerFestival.com | | | | | |
| Great American Beer Festival Pro-Am Competition | 6 | | | | |
| www.HomebrewersAssociation.org | | | | | |
| GrogTag | 57 | | | | |
| www.grogtag.com | | | | | |
| Harper Collins | 70 | | | | |
| www.harpercollins.com | | | | | |
| High Gravity Homebrewing & Winemaking Supplies... | 18 | | | | |
| www.highgravity.com | | | | | |
| High Hops @ the Windsor Gardener | 44 | | | | |
| www.highhops.net | | | | | |
| Hobby Beverage Equipment..... | 59 | | | | |
| www.minibrew.com | | | | | |
| Home Brewery, The | 43 | | | | |
| www.homebrewery.com | | | | | |
| HomeBrewStuff | 38 | | | | |
| www.Homebrewstuff.com | | | | | |
| Hopunion | 46 | | | | |
| www.Hopunion.com | | | | | |
| Keystone Homebrew Supply | 45 | | | | |
| www.keystonehomebrew.com | | | | | |
| Larry's Brewing Supply | 19 | | | | |
| www.larrysbrewsupply.com | | | | | |
| love2brew Homebrew Supply | 51 | | | | |
| www.love2brew.com | | | | | |
| Micro Matic USA, Inc..... | 8 | | | | |
| www.micromatic.com | | | | | |
| Midwest Supplies - Homebrewing and Winemaking | 13 | | | | |
| www.MidwestSupplies.com | | | | | |
| Monster Brewing Hardware | 22 | | | | |
| www.monsterbrewinghardware.com | | | | | |
| Moonlight Meadery | 18 | | | | |
| www.moonlightmeadery.com | | | | | |
| MoreBeer! Homebrewing Supplies | 8 | | | | |
| www.morebeer.com | | | | | |
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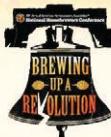
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An Ode to IPA



Have I ever sipped an IPA that I didn't like? Actually, yes, but it still captured my adoration.

I am a hophead, living with the unfounded fear that IPAs may someday be extinct. This lip-puckering style of beer has grown in popularity, and at the same time, there are those who dare say they cannot stand it. That's OK, because it means more for the rest of us.

If there is anything that deserves an ode, it is IPA.

Oh legendary IPA, you have been around for nearly 200 years, possibly more, and what a beginning you had. You traveled the seas and pulled through, like you always do.

I know where you began, but where did

my deep-rooted appreciation for your complex floral flavors begin? I trace it back to my days working as a server at a local brewpub.

Before this, my love of your tangy and citrusy aroma was cocooned within myself. Even though I had been a homebrewer before working at the brewpub, even directing my efforts at mocking the IPAs I had enjoyed, my palate was impartial and accepting of Pilsners, stouts, and bocks.

I think it all began with the shift beer. After every shift, the employees at the brewpub were awarded a free pint, if they so wanted. What a perfect follow-up to running around the establishment delivering trays of fresh, local brew. Sitting on the patio with a well-earned beer felt more fulfilling than the tips I had earned for the night.

The styles of beers were constantly rotating, and new ones were kegged by the week. I acquainted myself with all of them, as it's important for people serving beer to know their product. I enjoyed them all, but I found myself gravitating back to one—Hopasaurus Rex IPA. I delighted in the accented grapefruit taste as it sent tingles of delight to my brain receptors. It was like a punch in the mouth, but I couldn't resist asking for more.

I kept coming back and learned that I had the hops to thank. Consider this a formal thank you to the Centennial, Challenger, and Fuggles that so often complement the malt.

IPA newcomers are often seduced by the names alone—Smooth Hoperator, Hoptimus Prime, Modus Hoperandi, Hopportunity Knocks.

Every now and then, the brewpub would brew double IPAs; at 9 percent, they were served in 12-ounce glasses in place of imperial pints. That's something I really like about you, IPA—you make it easy to branch out. Your gains in popularity have helped you spread your wings and cover the United States with awesomely crafted bitters. Your tendrils have slowly been reaching out to places other than the U.S. and England.

But alas, you have not made your way to the land of Nicaragua. So if you see fit, find a way into the locals' hearts and start spreading your love down here, too.

Clint Cherepa is living in Nicaragua, dreaming about brewing the perfect IPA in a country with no homebrewing supplies. He is the author of the "Please Send Beer" Last Drop in the March/April 2012 Zymurgy.

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