Vol. 35 * No. 3 | May/June 2012

FOR THE HOMEBREWER & BEER LOVER

zymurgy®

The Journal of the American Homebrewers Association®

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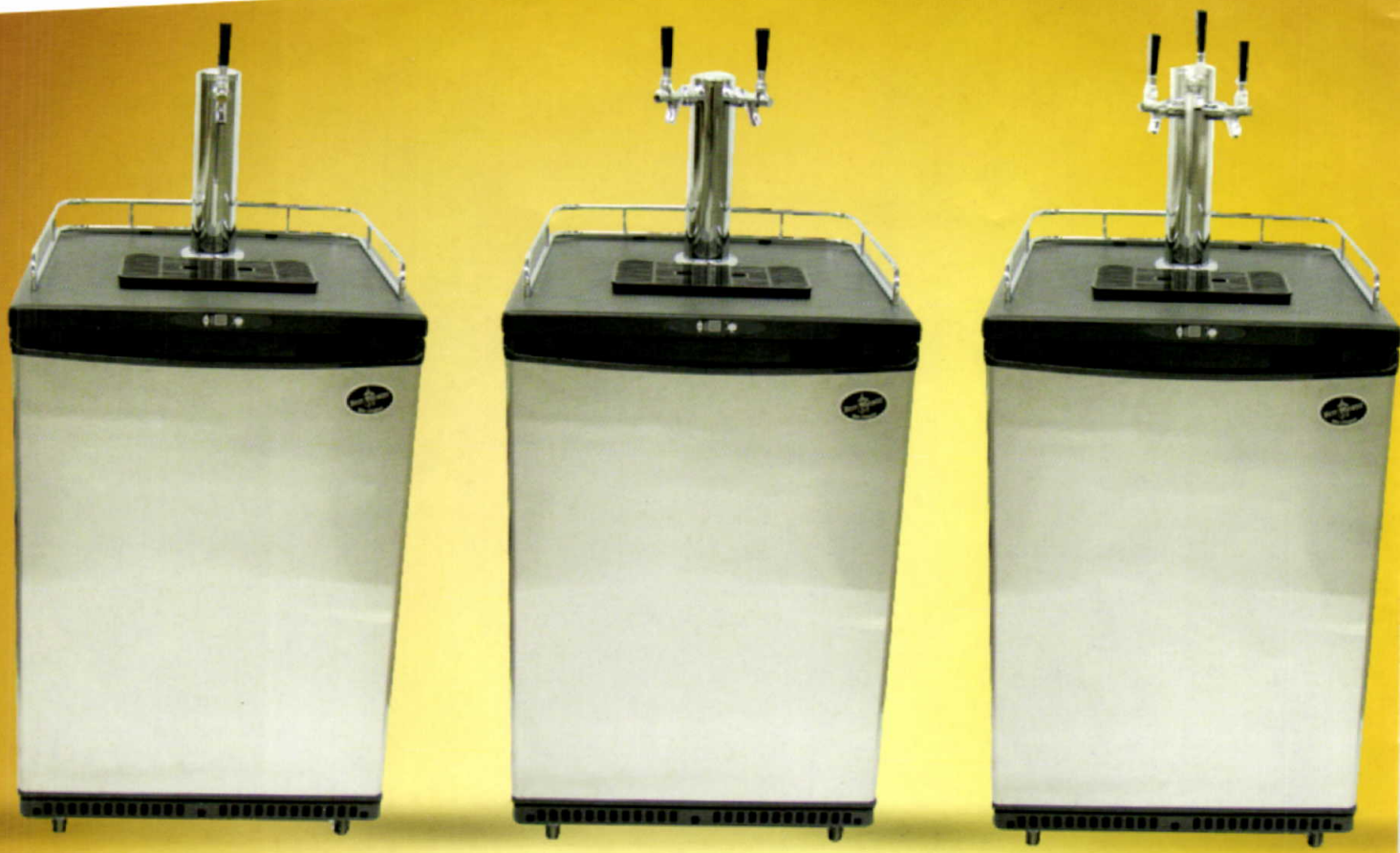

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The Original

by Jill Redding

2012 Beerdrinker of the Year

It's safe to say that J. Wilson has had a religious experience with beer.

During the Lenten season of 2011, Wilson decided the put the lore of "liquid bread" to the test and consumed only doppelbock and water for 46 days. The stronger version of traditional bock was first brewed in Munich by Paulaner monks, who drank it during times of fasting, when solid food was not permitted.

Wilson, a homebrewer, brewed Illuminator Doppelbock (based on his award-winning bock recipe) with the help of Eric Sorensen at Rock Bottom-West Des Moines. He drank four servings of it a day during the week and five on the weekend, and drank plenty of water and exercised to stay healthy during the experience. He lost 26 pounds during the 46 days.

He blogged about his fasting experience (www.brewvana.net) and it eventually became a book titled *Diary of a Part-Time Monk*, published last November. The project drew worldwide attention.

Wilson's feat and his devotion to good beer including organizing and volunteering at festivals, judging competitions, and as an active participant in North Carolina's Pop the Cap effort (2005) and Iowa's Lift the Limit (2010), helped him earn the title of Beerdrinker of the Year in the annual competition at the Wynkoop Brewing Co. in Denver on February 25.

He defeated worthy finalists Greg Nowatzki, a Las Vegas, Nev. homebrewer and accountant, and Warren Monteiro, a New York City homebrewer and the BeerSensei columnist for the Alestreet News, in front of a standing-room-only crowd at the Wynkoop. Wilson, a newspaper editor from Prescott, Iowa, won free beer for life at the Wynkoop, $250 worth of beer at his local watering hole (El Bait Shop in Des Moines, Iowa), and clothing proclaiming him to be the 2012 Beerdrinker of the Year. He will also get the opportunity to brew with Wynkoop head brewer Andy Brown.

The finalists were grilled by a panel of judges that included Brown, myself, and past champions Phil Farrell, Cody Christman, and Jack McDougall (the original Beerdrinker of the Year in 1997). Some sample questions:

"Who is the official beer sponsor of the London Olympics?"

"What's the best beer pairing with Rocky Mountain oysters?"

"What's the strangest ingredient you've ever brewed with?"

They also faced questions posed from their fellow finalists as well as the audience, attempted to identify three different beers (Anchor Steam, Saison Dupont, and Ommegang Three Philosophers) in a blind tasting, and presented their personal philosophies of beer drinking. Wilson's philosophy is "Living life in search of brewvana, an ideal condition of harmony, beer, and joy, I seek to educate on behalf of craft beer, folding good beer into a good life."

Jill Redding is editor-in-chief of *Zymurgy*.

zymurgy®

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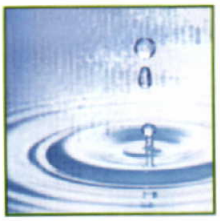
COLUMNS

DEPARTMENTS



FEATURES

ONLINE EXTRA

Brewin' with Bigfoot: National Homebrewers Conference Preview

To read this special, online-only feature, go to the Zymurgy page on HomebrewersAssociation.org.

QUICK RECIPE GUIDE

Cover design by Allison Seymour

>> GET THERE!

FIRESTONE WALKER INVITATIONAL BEER FEST

The first annual Firestone Walker Invitational Beer Fest is set for June 9 in Paso Robles, Calif. Some of the best breweries in the U.S. will be pouring their beers at the festival, which also features some of the Central Coast's top restaurants and food providers pairing their culinary skills with those of the brewers. Live music will also be a part of the festival.

Tickets ($60 plus fees) include tasters of both beer and food, a logoed snifter glass, and access to all of the music. Food will also be available for purchase.

The event is a benefit for the Pioneer Day committee, dedicated to the preservation of the unique history and culture of Paso Robles. For more information go to www.firestonebeerfest.com.

May 4-5
St. Louis Microfest
St. Louis, MO
stlmicrofest.org

May 12
Beer, Bourbon & BBQ Festival
Charlotte, NC
www.beerandbourbon.com

May 11-19
Frederick Beer Week
Frederick, MD
www.frederickbeer.com

May 18-20
Brewer's Memorial Ale Fest
Newport, OR
www.rogue.com

May 19
West Coast Brew Fest
Sacramento, CA
www.westcoastbrewfest.com

May 19
Maui Brewers Festival
Maui, HI
www.mauiarts.org

May 24-June 3
Asheville Beer Week
Asheville, N.C.
www.facebook.com

June 2
Boulder SourFest
Boulder, CO
www.averybrewing.com

June 6-10
Mondial de la Biere
Montreal, Quebec.
http://festivalmondialbiere.qc.ca/

June 8-9
SAVOR: An American Craft Beer & Food Experience
Washington, D.C.
www.savorcraftbeer.com

June 29-July 1
North American Organic Brewers Festival
Portland, OR
www.naobf.org

For more craft brewing events, go to www.craftbeer.com.

>> BREW NEWS

THE MOTHER OF ALL BEER WEEKS

Celebrate the flavor and diversity of American craft beer by participating in American Craft Beer Week May 14-20. American Craft Beer Week (ACBW) has been designated as a time for all legal-drinking-age Americans to explore and celebrate the flavorful beverages produced by our small, traditional, and independent brewers.

In 2011, brewers and retailers in all 50 states celebrated ACBW, with 1,521 official events posted on the ACBW calendar on CraftBeer.com.

"This the best time of year for local beer lovers," proclaimed the *Washington Post* about American Craft Beer Week in 2011.

To find an event near you for 2012, go to CraftBeer.com (News & Events section) and be sure to sign up on the ACBW Facebook page if you haven't already.

>> BREW NEWS

AHA'S COLLECTIVE HOPPINESS

On November 12, more than 220 AHA members had a hand in brewing Collective Hoppiness at the Wynkoop Brewing Co. in Denver. The brewery hosted an American Homebrewers Association Rally and wanted to do something special, so rally attendees each got to pitch hops into a unique batch of beer.

The beer was a hybrid creation, somewhere between a black IPA and an imperial red, elevated to special heights by a boost of rye and a 70-minute addition of communally added hops.

Wynkoop brewer Brad Landman provided a recipe for Collective Hoppiness along with some brewing notes, so be sure to grab 219 of your closest friends and get brewing!

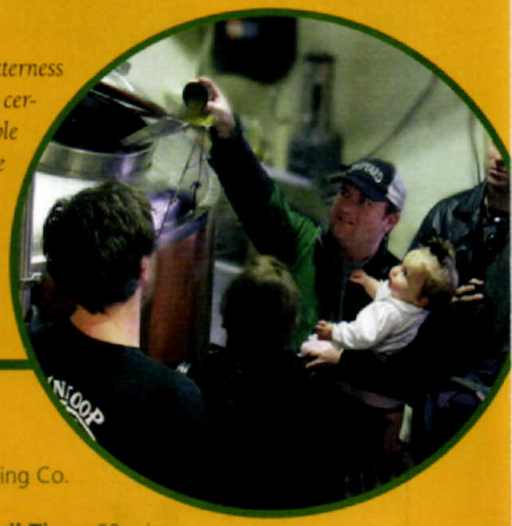
The Collective Hoppiness recipe was written with brewing experimentation in mind. It's a great recipe for changing one ingredient per batch to learn how that one variable affects the taste of the beer.

If you want to play with the yeast choices, I recommend sticking with one that'll leave a little sweetness in the beer—the recipe has very high amounts of alpha acids and a ridiculous 119.9 IBUs, according to BeerSmith.

The hops can be substituted as well. The recipe uses all high-alpha-acid hops in the boil to create some "shock and awe" in regards to the IBU scale. I plan to use this recipe at home as a showcase for different hop flavors and their characteristics, by using a single hop for all additions.

The grain bill can be played around with as well. You could make the beer a lighter color (and flavor) for summertime, add spices for a winter warmer, add roasted malt to make a hoppy rye stout, etc. I personally love the peppery flavors of rye beers and would love to try different versions of rye malts (malted rye, crystal rye, flaked rye, etc). If you want to change the grains, make sure to start the beer at a specific gravity of around 1.080.

Due to the high levels of bitterness and malt in this beer, it can certainly sit around for a couple of months (or more) before serving. So feel free to add time to the list of variables you can experiment with for this beer.



>> YOU'VE GOTTA DRINK THIS!

DUCLAW MISERY

Misery is a wheat wine brewed by a small brewer (who also happens to be my favorite brewer) in Maryland. It's dark golden in color with a crisp white head, and scents of mango, pineapple, tangerine, and grain on the nose. The taste is similar to the aroma, with some biscuit notes. Full bodied and delicious! This was the first beer of two that I drank. I immediately wrote the brewer to thank them for their creation. If I had to sum it all up in one word: "Wow!"

Reviewed by Timothy Lazaroff, Clifton, Va.

If you've had a beer you just have to tell the world about, send your description, in 150 words or fewer, to zymurgy@brewersassociation.org.

Collective Hoppiness

ALL-GRAIN VERSION

Recipe courtesy of Brad Landman, Wynkoop Brewing Co.

INGREDIENTS for 5 U.S. gallons (18.93 L)

12.5 lb (3 kg)	Rahr premium two-row pale malt
2.0 lb (0.9 kg)	Weyermann CaraRye® malt
6.5 oz (184 g)	flaked oats
6.5 oz (184 g)	Simpsons aromatic malt
3.3 oz (94 g)	Crisp dark chocolate malt
1.0 oz (28 g)	Columbus, 14.4% a.a. (60 min)
1.0 oz (28 g)	Columbus, 14.4% a.a. (60 min)
0.75 oz (21 g)	Summit, 18.5% a.a. (20 min)
1.0 oz (28 g)	Summit, 18.5% a.a. (10 min)
0.25 oz (7 g)	Amarillo, 8.5% a.a. (6 min)
1.0 oz (28 g)	Sorachi Ace, 14.9% a.a. (3 min)
1.0 oz (28 g)	Cascade (dry)
	British ale yeast

Boil Time: 60 min
Original Gravity: 1.083
IBUs: 120+ (estimated)
SRM: 19.5 (estimated)
Brewhouse Efficiency: 75%

DIRECTIONS

Mash grains at 153° F (67° C) for 60 minutes. Hops can be boiled as traditional one-time additions, or added continuously according to the following schedule: 2 oz Columbus from 60-30 minutes; 1.75 oz Summit from 30-10 minutes; 0.25 oz Amarillo from 10-5 minutes; 1 oz Sorachi Ace from 5-0 minutes; and the dry hop addition of 1 oz of Cascade in secondary.

Extract version: Use 9.45 lb (4.29 kg) pale malt extract, 1.5 lb (0.68 kg) Weyermann CaraRye® malt, 2.5 oz (71 g) Crisp dark chocolate malt, 7.0 oz (198 g) Weyermann CaraFoam® malt, and 7.0 oz (198 g) Weyermann CaraVienne® malt. Steep grains for 20 minutes in 150-160° F (66-71° C) water; strain, rinse, add extract, and proceed with boil.

By Gary Glass

15th Annual Big Brew Celebration

On May 5, the American Homebrewers Association celebrates National Homebrew Day (recognized by the U.S. Congress as May 7 back in 1988) with the 15th annual Big Brew—a worldwide brew-in held each year on the first Saturday in May. Thousands of homebrewers from around the globe will gather at registered sites and brew the official Big Brew recipes all at the same time. We're talkin' some serious homebrewer solidarity here. There's even a simultaneous toast that takes place at noon Central Time (5 p.m. Greenwich Mean Time).

This year's official recipes are an across-the-pond collaboration. After exchanging some emails with Matthew Hicks, vice chair of the UK's Craft Brewing Association (CBA) about how the AHA and CBA might collaborate, we struck upon the idea of using a pair of recipes, one English and the other an Americanized version of that English style, for Big Brew. What we came up with is two brown ale recipes. The first is Matthew's own Ardley Northern English Brown, and the second is Bucksnort Brown, an American-style brown ale recipe from Mike and Steve Brown (fitting name, eh?) that took a silver medal in the 2011 National Homebrew Competition.

The two styles are a good fit for Big Brew. American homebrewing, when the hobby was reigniting in the 1960s and 1970s, took much of its inspiration from traditional English beers. Those English styles quickly evolved into their own American versions of the beers, using American malt, hops, and yeast. American brown ale was one of the original uniquely American styles developed by homebrew-

Ardley Brown Ale (Northern English Brown Ale)

2012 BIG BREW EXTRACT RECIPE

INGREDIENTS
for 5.25 U.S. gallons (19.8 L)

6.5 lb (2.95 kg)	pale malt extract syrup
7.0 oz (198 g)	80° L Cara Munich malt
3.0 oz (85 g)	chocolate malt
2.0 oz (57 g)	roast barley
1.25 oz (35 g)	E.K. Golding whole hops, 4.7% a.a. (60 min)
0.75 oz (21 g)	Fuggles pellet hops, 5.7% a.a. (15 min)
2.0 oz (57 g)	E.K. Golding pellet hops, 4.7% a.a. (knockout)
1 tablet	Whirlfloc or 0.75 tsp (3 g) Irish moss (15 min)
2 pkgs	Danstar Nottingham ale yeast

Boil Time: 60 min
Original Gravity: 1.049
Final Gravity: 1.012
SRM: 16.3
IBU: 24.9
Brewhouse Efficiency: 75%

DIRECTIONS
Steep grains in 2.5 gallons (11.4 L) of water at 160-170° F (71-77° C) for 30 minutes. While removing grains, rinse with 0.5 gallon of hot water, then add extract, dissolving completely. Bring to a boil. Add hops at specified intervals from end of boil. Chill wort, remove hops and transfer to sanitized fermenter. Add 2-3 gallons (7.6-11.4 L) of pre-boiled and chilled water for a total volume of 5.25 gallons (19.8 L). Pitch the yeast when wort reaches 67° F (19° C). Secure air lock or blow-off tube. Ferment at 67° F (19° C). Keg at 2.4 volumes of CO_2 or bottle carbonate with 3.7 oz (105 g) corn sugar.

LEFT: Brewing up a batch of Bucksnort Brown on a BA staff brew day.

Iowa Brewers Union, Big Brew 2011

Bucksnort Brown Ale (American Brown Ale)

2012 BIG BREW EXTRACT RECIPE

INGREDIENTS

for 5.25 U.S. gallons (19.8 L)

7.25 lb	(3.29 kg) pale malt extract syrup
8.0 oz	(227 g) 90° L crystal malt
8.0 oz	(227 g) 60° L crystal malt
6.5 oz	(184 g) chocolate malt
1.0 oz	(28 g) black patent malt
1.0 oz	(28 g) Willamette whole hops, 5.7% a.a. (80 min)
0.75 oz	(21 g) Willamette whole hops, 5.7% a.a. (30 min)
1.25 oz	(35 g) Mt Hood whole hops, 6.1% a.a. (15 min)
0.75 oz	(21 g) Willamette whole hops, 5.7% a.a. (5 min)
1 tablet	Whirlfloc or 0.75 tsp (3 g) Irish moss (15 min)
2 pkgs	Wyeast No. 1056 American ale yeast, Safale US-05, or White Labs WLP001

DIRECTIONS

Steep grains in 2.5 gallons (11.4 L) of water at 160-170° F (71-77° C) for 30 minutes. While removing grains, rinse with 0.5 gallon of hot water, then add extract, dissolving completely. Bring to a boil. Add hops at specified intervals from end of boil. Chill wort, remove hops, and transfer to sanitized fermenter. Add 2-3 gallons (7.6-11.4 L) of pre-boiled and chilled water for a total volume of 5.25 gallons (19.8 L). Pitch the yeast when wort reaches 65-67° F (18-19° C). Secure air lock or blow-off tube. Ferment at 66-68° F (20-21°C). Keg at 2.4 volumes of CO_2 or bottle carbonate with 3.7 oz (105 g) corn sugar.

Boil Time: 80 min
Original Gravity: 1.058
Final Gravity: 1.014
SRM: 22
IBU: 38
Brewhouse Efficiency: 75%

ers (and popularized by Pete's Wicked Ale here in the states).

For more information on Big Brew, or to register a site, visit the Events section of HomebrewersAssociation.org.

Homebrewing Rights

Bills to legalize homebrewing have been filed in both Alabama and Mississippi, the two remaining states where homebrewing is not yet legal. In Alabama, Rep. Mac McCutcheon is again sponsoring a homebrew bill. The bill language has been modified from the 2011 bill to address some of the concerns raised last year when the bill was defeated. Hopefully, this year's bill will see it through the legislature. See www.alahomebrewing.org, the website for the Alabama Homebrewing Legalization group that the AHA has been working with for the past several years, for information on how to get involved.

In Mississippi, Raise Your Pints (RYP) has taken a leading role in the effort to legalize homebrewing in the state. Raise Your Pints is an organization whose mission is "to promote and enhance craft beer culture in Mississippi by working to lift the ban on high gravity beer; clarify the status of homebrewing as a legal, fun, and wholesome hobby; promote Mississippi's beer, brewpub, and brewing industries and small businesses; and work to broaden the appreciation of craft beer for all Mississippians." This year's effort has gotten off to a great start with six beer-related bills, including three homebrew bills filed early in the session and with more likely to come. Hopefully the number of bills is indicative of a shift in the Mississippi legislature's willingness to address the state's archaic beer laws. Check out raiseyourpints.com to follow progress in making Mississippi a more beer- and brewer-friendly state.

Last spring, the Wisconsin Department of Revenue determined that existing law did not allow for homebrew to be removed from the home where it was brewed. Since then, the AHA has helped homebrewers in the state form the Wisconsin Homebrewers Alliance and draft legislation aimed at expanding homebrewing rights to allow homebrewers to transport

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Ardley Brown Ale (Northern English Brown Ale)

ALL GRAIN RECIPE

INGREDIENTS

for 5.25 U.S. gallons (19.8 L)

4.75 lb (2.15 kg)	Maris Otter pale malt
2.81 lb (1.28 kg)	Munich I malt
1.18 lb (539 g)	amber malt
5.0 oz (142 g)	wheat malt
2.5 oz (71 g)	chocolate malt
1.5 oz (43 g)	roast barley
1.0 oz (28 g)	E.K. Golding whole hops, 4.7% a.a. (60 min)
0.75 oz (21 g)	Fuggles pellet hops, 5.7% a.a. (15 min)
2.0 oz (57 g)	E.K. Golding pellet hops, 4.7% a.a. (knockout)
1 tablet	Whirlfloc or 0.75 tsp (3 g) Irish moss (15 min)
2 pkgs	Danstar Nottingham ale yeast

Boil Time: 60 min
Original Gravity: 1.049
Final Gravity: 1.012
SRM: 16.2
IBU: 24.9
Brewhouse Efficiency: 75%

DIRECTIONS

Mash grains at 150° F (65° C) for 1 hour. Sparge at 168° F (76° C). Bring to a boil. Add hops at specified intervals from end of boil. Chill to 67° F (19° C) and pitch yeast. Secure airlock or blow-off tube. Ferment at 67° F (19° C). Keg at 2.4 volumes of CO_2 or bottle carbonate with 3.7 oz (105 g) corn sugar.

Bucksnort Brown Ale (American Brown Ale)

2012 BIG BREW ALL-GRAIN RECIPE

INGREDIENTS

for 5.25 U.S. gallons (19.8 L)

10.0 lb (4.54 kg)	pale two-row malt
8.0 oz (227 g)	90° L crystal malt
8.0 oz (227 g)	60° L crystal malt
6.5 oz (184 g)	chocolate malt
1.0 oz (28 g)	black patent malt
0.75 oz (21 g)	Willamette whole hops, 5.7% a.a. (80 min)
0.75 oz (21 g)	Willamette whole hops, 5.7% a.a. (30 min)
1.25 oz (35 g)	Mt Hood whole hops, 6.1% a.a. (15 min)
0.75 oz (21 g)	Willamette whole hops, 5.7% a.a. (5 min)
1 tablet	Whirlfloc or 0.75 tsp (3 g) Irish moss (15 min)
2 pkgs	Wyeast No. 1056 American ale yeast, Safeale US-05, or White Labs WLP001

Boil Time: 80 min
Original Gravity: 1.058
Final Gravity: 1.014
SRM: 22
IBU: 38
Brewhouse Efficiency: 75%

DIRECTIONS

Mash grains at 154° F (68° C) for 1 hour. Sparge at 168° F (76° C). Bring to a boil. Add hops at specified intervals from end of boil. Chill to 65-67° F (18-19° C) and pitch yeast. Secure airlock or blow-off tube. Ferment at 66-68° F (20-21° C). Keg at 2.4 volumes of CO_2 or bottle carbonate with 3.7 oz (105 g) corn sugar.

their beer from their homes, so that homebrewers can share their beer with friends and homebrew club members and enter homebrew competitions. An amended bill passed both the Assembly and the Senate in mid-March, and was signed into law on April 2.

In Ohio, the AHA is working with homebrewers on a bill similar to that in Wisconsin, with the aim of ensuring that homebrewers can share their beer and enter competitions. Ohio is fairly unique in that the current alcohol code does not address homebrew at all, though the Ohio Department of Liquor Control considers homebrewing to be legal, since it is not sold and is legal under federal law. However, without a homebrew-specific law on the books, it is unclear whether or not it is legal to transport homebrew or hold homebrew competitions.

Earlier this year, the New Jersey legislature passed Assembly Bill 4012, eliminating the little-known and unenforced requirement for homebrewers to purchase annual permits to brew. All you New Jersey homebrewers can rest easy now that the permit requirement you never knew about is gone.

The AHA actively supports homebrewing rights, wherever those rights are either not granted or are threatened. We send our members action alerts about legislation that will affect your rights as a homebrewer or your access to the commercial craft beers you love (when you're not drinking homebrew). Your membership dollars are what makes that possible.

As I write this column, we in the AHA office are celebrating surpassing 30,000 members in the association. In my travels around the country, I am always struck by the fact that no matter where they're from, homebrewers are just great people to be around. It is a real honor for us to serve 30,000+ homebrewers every day. Each and every member of the AHA helps make this organization better. Thank you!

Until next time, happy homebrewing!

Gary Glass is director of the American Homebrewers Association.

Revisiting Extract Brewing

Dear **Zymurgy**,

I wanted to comment on the "Revisiting Extract Brewing" article by Mark Pasquinelli in the January/February 2012 issue of **Zymurgy**. I started on this path myself a couple of months back, but for a very different reason than Mark. When my second daughter was born back in May, I suddenly found that my available brewing time had gone from slim to none! Or so I thought, at any rate. I spent a while getting the occasional keg of commercial beer, but missed the chance to brew my own. So, a couple of months ago, I decided to give extract brewing a go, and found that I could still fit in an extract brew now and again.

I just finished one this evening, in fact. I left for the brew store (daughters in tow) at 1 p.m. I was home by 2:30 with fresh steeping grain and yeast, and the girls were ready for a nap. By the time they awoke at 3:30, I had finished steeping and was bringing the wort up to a boil. At 5:15 (10 minutes before my wife walked in the door), the wort went in the sink to chill (no outside water = no immersion chiller... back to basics!). At 6:00, dinner was served, and the beer was in the fermenter, pitched, and in the fermenting corner.

Photo © Nate Hudson

The upshot: There's always time to brew, if you think about it (although extract makes it much easier). I got in a trip to the store, and a brew, while taking sole care of two girls. And if I can do it, so can you!

Evan Van Dyke
Rolling Meadows, Ill.

P.S. If you haven't tried Fermcap-S, it really helps. It makes a boilover nearly impossible...a real must when taking care of naps, diapers, snack time, and dancing in the living room while your wort is boiling.

Defining a Session Beer

Dear *Zymurgy*,

I am writing in regard to the term "session beer." In the March/April 2012 issue, one of the Commercial Calibration beers, Moylan's Dragoons Dry Irish Stout, is described as a low alcohol session beer. As a homebrewer, when I wish to enjoy large volumes of beer in an evening, I target beers of 4 percent alcohol by volume or less. I find it puzzling that one would consider a 5-percent alcohol by volume beer to fit this description. I think it can mislead the ordinary beer drinker into thinking they can drink more of this beer than say a normal ale or lager.

In the three countries well-known for session beers, namely Ireland, England, and the Czech Republic, this description is applied to beers 4 percent and under, or what is called 3.2 wt% beer in the U.S. A 5 percent by volume beer is typically referred to as premium in the Czech Republic. On my last visit to the UK, I did not find one cask bitter over 4 percent. And in Ireland, I believe the draught Guinness and other stouts are at 4 percent.

Therefore, I would consider a beer 4.5 to 5.5 percent to be "normal" strength, not low. This is not the first time I have found either *Zymurgy* or other craft publications or breweries to make this reference. I see the need for the AHA to really define the term "session beer" to be under 4.5 percent alcohol by volume.

Jim Dunlap
Woodinville, Wash.

Simple Pleasures, Indeed

Dear *Zymurgy*,

Let me jump on board with Justin A. Pytlak from H-Block Brewery who wrote the letter entitled "Simple Pleasures" (March/April 2012 Dear *Zymurgy*). The ingredient list for some, no, many of the recipes listed in *Zymurgy* borders on the ridiculous. Demerara sugar? Hibiscus flowers? Ipē wood? C'mon. Are these things really going to make better beers? Let's tone it down a little.

John Coloe
Sound Beach, N.Y.
Two decades + of homebrewing

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.

by Professor Surfeit

100 IBUs: Possible or Not?

Dear Professor,
I recently saw an IPA recipe from Jamil Zainasheff that listed the IBUs at 100. Is this in the realistically attainable range on a basic homebrew setup (full volume boil pot and mash tun only) with "normal" hops/hop products (whole leaf, pellets, or plugs)? I recall reading somewhere that 80-85 IBUs was the max without special equipment.

Mike Killgore

Dear Mike,
Attaining 100 IBUs as a homebrewer using hop pellets or whole hops is quite improbable if not impossible. That being said, the bitterness perception of a beer might be on par with a hop-extract-bullied ale. Tasting comparisons might lead you to believe in the Holy Grail of 100 BUs, but let's slow down a bit and consider a few other things.

There are a lot of things that can be put into beer that give the perception of intensified bitterness. Lo and behold, there are compounds in whole and pellet hops that are bitter, yet they don't register as IBUs, because those bitter flavors are not isomerized alpha acids. If you don't believe me, tuck a few hops between your cheek and gum and bliss out on the bitterness. This isn't isomerized alpha acid bitterness measured by IBU detectors. Some of it is certainly alpha acid, but there are a lot of other compounds that are bitter in the hop.

Photo © Shutterstock

When you dump a lot of hops into the late stages of boiling, or "dry hop" in fermenters or cellar tanks, you are extracting lots of flavors that would have been volatilized by the boiling process but aren't—because you didn't boil them. End result: you get a wallop of hop characters that are all kinds of bitterness.

Sorry to burst your bubble about 100 IBUs, but relax, don't worry, and bliss out on what you think is blissful bitterness. Either that or start adding hop extract to goose your brews...but in my opinion, why bother just for bragging rights?

Blissing out on perception,
The Professor, Hb.D.

The Scoop on Brown Malt

Dear Professor,

What's the best way to get the most out of brown malt? I've found a grain chart that states brown malt needs to mashed, but I've also found published recipes with brown malt used as a steeping grain. As an extract brewer, can I steep away, or take the plunge and do a first extract mash?

Joe Lyons

Dear Joe,

Remember, homebrewers can do ***anything****. That said, if you simply steep crushed brown malt in hot water prior to adding extract and boiling, you may or may not get conversion. If the steep is at mash temperatures (roughly 150-160° F [65.5-71° C]) you'll get partial or complete conversion. In other words, you've mashed. If the temperature is much below or above this range, you'll get toasted brown malt flavor, but also starch carryover into your brew. For homebrewers, it's not the end of the world, but you may have haze, and beer flavor and stability issues.*

It's to your advantage to mash the brown malt at mash temperatures and target full conversion. Brown malt is an interesting malt to use. Using it in small amounts can add some subtly complex character, while in grand amounts, it'll pack a wallop of character.

Browning out,
The Professor, Hb.D.

Herbal Confusion

Dear Professor,

I'm anxious to give Charlie Papazian's Delirium Oat Rosemary Pale Ale recipe (January/February 2012 World of Worts) a try. I don't have a lot of experience working with fresh herbs, so I am not really familiar with what "stem-end" rosemary means, nor what "dry herbing" is. I presume this is simply fresh cut rosemary, stems clipped, and dried using one's preferred herb drying method?

Also, as far as the half-ounce weight, should I presume that is the weight once dried, or is that the fresh cut weight, prior to drying? Maybe these are minor details for which I really should simply relax and pop open a homebrew, but I really don't want to overdo the rosemary.

Thanks!
Ron Ferraro

Dear Ron,

I've consulted with that scalawag Papazian and asked him to clarify for all my readers. What he intended to convey was to use a freshly cut (not dried) stem of live rosemary weighing a half ounce. And his reference to "dry herbing" was related to procedure;

using the freshly cut rosemary as you would when "dry" hopping. Add the fresh (not dried) rosemary to the secondary fermenter prior to bottling or kegging.

Hopologies and herbal on,
The Professor, Hb.D.

Not Feeling the Chill

Dear Professor,
I've been having trouble cooling my 5-gallon batch of wort down to pitching temperature with my new plate chiller. The following data is provided to help with any suggestions.

I use a 40 plate welded heat exchanger 7.5" wide x 4" deep x 3" thick front to back. Inlet water temperature last used was 55° F and was run through an XL type immersion chiller with 1/2" diameter copper tubing sitting in 3-4 gallons of ice water. The discharge pressure at the hose bib is 60 PSI and the pressure drop is through 20' of 5/8" garden hose, then the copper tube chiller and another 20' of 5/8" garden hose. The garden hose is not straight but also not kinked. The plate chiller discharge pressure drop is through 15' of 5/8" garden hose and maybe 2-3 feet of elevation rise.

The heat exchanger inlet sits about 8" below the boil kettle outlet and I use gravity to move the wort through it. I use a 1/2" ID tube about 36" long between the kettle and heat exchanger. With the valve wide open, I get a pretty good flow. The chiller is cleaned well in both directions after use, so I'm confident it is not clogged.

I have used this chiller five times now and each time I vary both the flow of wort and the flow rate of the cooling water, but cannot find the correct combination of flows. If I remember my engineering heat transfer class, counter flow surface temperature means everything, so I think if the spaces between the plates are "flooded," then I have maximum surface area contact, but I have tried all combinations of flow with no luck.

During the most recent use, I was only able to get the temperature down to an average of 95° F. I must be doing something wrong. Based on everything I read, I should be able to get my plate discharge temperature down below 70° F.

With a mechanical engineering background, I'm embarrassed to not be able to figure this out.

Tom Bosak
Pittsburgh, Pa.

Dear Tom,
I too studied dear old mechanical engineering, but to no avail. You've certainly presented a whole bunch of data that a certified, bonafide mechanical engineer like yourself could use to figure this thing out.

I can't unravel all your data with a definitive answer. But if I were you, I'd be testing this contraption with water instead of wort to get it close to right. Yes, I know wort has a different specific gravity and may not cool down as fast as water, but you'll get close enough to figure things out.

I have to assume that you have "contact" as you say; that inside this thing the copper piping carrying the hot wort is in contact and surrounded by the conveyed cold water. With tap water temperature of 55° F, you should be able to chill your wort just fine. With added cooling with ice water, you have good reason to be scratching your head and getting thirsty.

I'd start with exploring the flow rate. The wort is going through too fast or the cold water is going through too slowly. Never mind all the pressure readings—just observe the rate of flow coming out and going in. Actually, observe the flow rates of what comes out—that's what's most important. Adjust the inflow and you should get there.

If this fails, you've got a lemon on your hands. At that point, I'd have to figure there's not enough "contact" between hot and cold plumbing inside your chiller.

Life's an itch,
The Professor, Hb.D.

Hey homebrewers! If you have a brewing-related question for Professor Surfeit, send it to "Dear Professor," PO Box 1679, Boulder CO 80306-1679; fax 303-447-2825; or e-mail professor@brewersassociation.org.

by Amahl Turczyn Scheppach

Scottish Ales

Illustration © Shutterstock

AMERICAN HOMEBREWERS ASSOCIATION CLUB ONLY COMPETITION

Scottish and Irish Ale

Entries are due May 10 and judging will be held May 19. Entry fee is $7. Make checks payable to American Homebrewers Association.

Entry Shipping:

Dr. Jeckyll's Beer Lab
c/o AHA COC
2408 W. Park Row
Arlington, TX 76013

Hosted by Mike Porter and the Knights of the Brown Bottle club of Arlington, Texas, this competition covers BJCP Category 9. For more information, contact Mike Porter at msrwl5@sbcglobal.net.

Scottish and Irish ales are malty, deceptively complex beers brewed from what has traditionally been a very simple recipe. From lowest to highest strength, they have been somewhat arbitrarily divided into Scottish Light, Heavy, Export, and Strong subcategories, with Irish Red ales filling in some of the gap between the top gravity of Export (1.054) and the bottom gravity of Strong (1.070). This gap exists mainly due to the use of parti-gyle mashing, a technique used by thrifty Scottish brewers in which a first-run strong ale was boiled and fermented separately from a second-run low strength beer from the same mash. Brewers were thereby able to make the most of their good Scottish malt.

Local ingredients and conditions shaped Scottish ales; high-quality barley and soft, pure water have always been the emphasis of these beers, and the cooler climates meant long, cool fermentations. Conspicuously absent (or at least minimized) were hops, which did not grow as well as they did in the southern reaches of the UK. Since English hops were expensive, Scottish brewers used far less, and balanced the sweetness of their beers with grain bitterness from roast barley (and, for the strongest beers, alcohol). These weren't stouts, however—typically no more than 3-percent roast was used in the grain bill, just enough to provide a rich red color, complexity, and a bit of dryness in the finish. The balance of the grain bill was pale malt, and that formula could simply be scaled to the desired strength.

It is important to realize that from a beer style perspective, "Scottish" ales are distinct from "Scotch" ales in terms of strength only. Your average Scot would protest that Scotch refers to that other noble malt beverage, but in beer style terms, Scotch ale is a type of Scottish ale with an original gravity of 1.070 or higher.

Now that we've addressed what Scottish ales should be, we should mention a few things to avoid when making them. But first, another important distinction: An historically accurate rendition of an ancient style like Scottish ale is not always what modern-day competition judges are looking for. Why is this important? Because brewing a Scottish ale the way they were brewed two hundred years

ago may be a great history lesson, but ancient and modern perceptions of how those beers should taste are surely very different. As a result, that super-accurate 1850 140 Schilling Edinburgh Wee Heavy might be a spot-on replica, but that doesn't mean it will score well at your local competition. With that in mind, let's look at a few Scottish ale don'ts.

Many brewers associate Scottish and Irish ales with peated or smoked barley. Since so many regional varieties of Scotch whiskey make use of peated barley, shouldn't beer? Well, as it turns out, no. Sure, one can always argue that this is homebrewing, and one should be allowed to use peated malt, caramel malt, sour malt, or whatever else. Stylistically as well as traditionally, however, there really is no such thing as a peated Scottish ale. Back before clean heat sources were used to kiln malt, there would almost certainly have been smoke character picked up by the grain as it was dried, and in many parts of Scotland, this may very well have been peat smoke. But peated distillers' malt and brewers' malt eventually diverged, and since that time, for all intents and purposes, ne'er the twain have met.

Why, then, can one detect low levels of smoke in some Scotch ales? One answer is "phenols." Yeast used for centuries in Edinburgh breweries and in other parts of Scotland may produce a smoky complexity during fermentation, and the Scottish ale strain most available to homebrewers may do this as well; but if present, any yeast-derived smoke should be very, very subtle. Helping it along with a few ounces of distillery peated malt in the grain bill will only boot your effort into category 22B, Other Smoked Beer. (And the fact that a good number of craft breweries are doing this does not make it OK!) Some hints of smoky character may come from normally kilned Scottish malt, roast barley or even well water, but please reserve the smoked malt for Rauchbier.

Another typical Scottish ale association is with caramel character, and rightfully so; but in this case, the historical method is the correct path. Caramel malts were not available to Scottish brewers; malt complexity and caramel character came from

long boils, and that practice is still a hallmark of Scottish brewing. So for homebrewers, the temptation to add caramel malt should be resisted. Dr. David Brown, a former technical director of Scottish & Newcastle, is quoted in Greg Noonan's seminal *Scotch Ale* as saying, "The maltiness is not from crystal. Roast barley accounts for flavor, rather than caramel malt as the English do. This is by a tradition that has stood for hundreds of years, rich and sweet beers." Of course, there are acceptable shortcuts. For example, brewers may still achieve the necessary Maillard reactions critical to the style by reducing the first runnings from the mash tun by half or more; this can be done separately from the main boil, perhaps on the stove top, and then added back to the kettle once the desired level of caramelization has been achieved.

Malt quality is obviously critical to the style. Malt type is more of a preference. One can make a perfectly serviceable Scottish ale with Maris Otter malt, but it will have a bit more of a biscuit malt quality than one made with a softer, mellower malt like Golden Promise. The full range of Scottish ales, from 60 Schilling Scottish Light to 140 Schilling Wee Heavy can be made with 98-100 percent pale malt and 0-3 percent roast barley, though Noonan's book recommends an addition of dextrin malt for added body. Hops are minimized here, but the variety is still important. Favor Goldings and Fuggles, or their similar offspring varieties. Water should

Barking Dog Scottish Ale

This recipe is based on the "Barking Dog Scottish Ale" recipe by Jeff Niggemeyer. This award-winning homebrew recipe was scaled up and brewed by Big Time Brewing Co., winning the gold medal in the 2008 Great American Beer Festival (GABF) Pro-Am competition.

INGREDIENTS

for 5.25 US gallons (20 liters) with a 3.5 gallon (13.2 L) boil

2 cans	(6.6 lb or 3 kg) Coopers Light Malt Extract
0.5 lb	(0.23 kg) Coopers Light Dry Malt Extract
0.5 lb	(0.23 kg) Crystal Malt (120° L)
2.0 oz	(57 g) Roasted Barley (300° L)
1.75 oz	(50 g) Fuggle hop pellets, 4% a.a. (60 min)
0.5 tsp	(1.25 g) Irish moss (15 min)
1 to 2 packages	Wyeast 1098 British Ale yeast or White Labs WLP005 British Ale yeast
	Coopers Brewery Carbonation Drops for bottling

Original Specific Gravity: 1.050
Final Specific Gravity: 1.013
IBU: 22
ABV: 4.9%

DIRECTIONS

Steep grains in 2 gallons (7.6 L) of 150° F (71° C) water for 30 minutes. Strain and sparge with 0.5 gallon (1.9 L) of 170° F (77° C) water. Stir in malt extract, and top up with water to 3.5 gallons (13.2 L). Bring to a boil and add the hops. Boil for 45 minutes and add the re-hydrated Irish moss. Continue boiling for 15 minutes. Cool the wort, then pour into fermenter with enough pre-boiled cool water to make 5.25 gallons (20 L). Aerate and pitch yeast when temperature drops to 60-63° F (15-17° C). Ferment at 63° F (17° C) for one week or until fermentation is complete. Age in secondary for two weeks at 60° F (15° C). Prime with Coopers Brewery carbonation drops at bottling for a carbonation of approximately 1.0-1.5 volumes of CO_2. After the beer is carbonated, store for a couple of weeks at serving temperature of 50-54° F (10-12° C) before serving.

be soft to medium in hardness; very soft or reverse-osmosis filtered water would benefit from having a scant addition (1 teaspoon) of calcium chloride per five gallons, but otherwise Scottish ales are fairly forgiving.

Fortunately, there are some very good liquid yeast strains available to homebrewers that come directly from Scottish breweries. Both White Labs WLP028 Edinburgh and Wyeast 1728 Scottish ale yeasts are said to come from McEwan's, and indeed they do exhibit similar characteristics. Lower strength Scottish ales will turn out substantially maltier with this yeast than with other strains, while attenuation tends to be lower; in terms of percentage, expect low 70s. For stronger Scotch ales, it becomes important to pitch a great deal of yeast slurry to minimize ester production. In fact, it is highly recommended that you brew a middle-range Scottish ale first, and use the entire yeast cake for your strong Scotch ale. Wort should be well-chilled at pitching (at warmest 65° F, 18° C), again to minimize esters. Historically, brewers even restricted wort aeration prior to pitching for the same reason.

Here, however, one needs to again address the historical accuracy vs. modern standards question. Ancient Scotch ales were fermented at temperatures well below modern yeast producers' recommended temperature ranges, and oxygen starvation would further prevent yeast reproduction, leading to a very smooth, and most certainly under-attenuated beer. Finishing gravities of 1.055 were not uncommon with some of the bigger brews. Scots liked their beers big, malty and sweet, to the point of being sticky. For modern, more completely fermented versions, however, moderate wort aeration is definitely recommended, and fermentation temperatures of 63 to 65° F (17-18° C) will still produce a smooth Scotch ale without risking a stalled or stuck fermentation. Even at these temperatures, for Scotch ales above 1.070, expect a two- or even three-week fermentation. Note that even for lighter ales, Scottish ale yeast likes to jump out of the fermenter once it gets going, so be prepare to beat it back into the brew as the Scots did, or have blow-off equipment handy.

Also be prepared to age your stronger Scottish ales; 1.075+ original gravity Scotch ales can easily be cellared a year before serving, and will continue to improve for years afterwards. The smaller beers, 80 Schilling Export and below (1.054-), should be consumed fresh, as they do not possess the alcohol to adequately preserve them longer than a few months.

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

Reference

Noonan, Gregory J. Scotch Ale, *Classic Beer Style Series No. 8*, Brewers Publications, Boulder, CO, 1993. p. 43.

The Lure of BRETTANOMYCES

Over the past decade, homebrewers and professional brewers alike have been lured by the distinct characteristics that *Brettanomyces* yeast can impart through fermentation. With commercial yeast companies offering three to four unique strains, there has never been a better time to give this complex yeast a try and see for yourself where the wild *Brett* can take you.

While historically considered "wild yeast," the *Brettanomyces* of today and its application in brewing is hardly wild. That isn't to say that all the romance has been stripped away and we are left with a tamed beast, or even that designating beers fermented with *Brettanomyces* as wild ale isn't fitting. It's simply that this once-revered yeast now has an established place in brewing, and our working knowledge of its abilities is expanding at a greater rate than ever.

BY CHAD YAKOBSON

Ale, Lager, or Brett?

For brewers, "wild" beers are often associated with uncontrolled or spontaneous fermentation. The name has come to be associated with beers brewed using *Brettanomyces* yeast, but beers that end up with the "wild ale" moniker usually have a pronounced acidity from a mixed fermentation with bacteria. These beers are more often termed American sour ales, usually with primary fermentation conducted with a clean-fermenting *Saccharomyces* strain. In this regard, 100 percent *Brettanomyces* or "*Brett*" beer is a whole new beast—not really ale and certainly not lager. The use of *Brett* for primary fermentation and even mixed/hybrid fermentation introduces a new class of beer.

So where is the distinction to be made, or maybe the question should be: why does there need to be one? Reasons for producing all-*Brett* beers range from historical reproduction to experimentation, so perhaps a specific term for this new class is unimportant. For right now, *Brettanomyces* says enough.

According to one definition, a "beer style" is a term that seeks to describe and differentiate between varieties of beer based on sensory evaluation of present-day examples, as well as past knowledge of how a specific variety has evolved over time. *Brettanomyces* beers resist this method of beer style classification, since present-day examples for evaluation are hard to come by, and there is little or no historical precedent with which to compare them. The nature and short-term perspective of *Brettanomyces*-fermented beers is therefore anti-style in that there is no perception of what these beers should be like at this current time. Therefore to the homebrewer with a passion for exploring the untamed wilds of experimental brewing, *Brettanomyces* fermentations offer an opportunity to create one's own style.

Four Categories of Brett Beers

A breakdown of *Brett* and its uses for fermentation can go a long way in deciding how best to use these yeasts. *Brett* beers can loosely be broken into four categories based on the method of fermentation. The first two involve 100 percent of the prima-

ry fermentation performed by *Brett*, and can be clean or sour. These two types of primary fermentation create beers of distinctly different character due to the levels of acidity, aromas, and flavors created.

The third category of *Brett* beers is the hybrid or mixed fermentation consisting of both *Saccharomyces* and *Brettanomyces*. These types of *Brett* beers tend to be fairly complex, with different fermentation techniques aimed at achieving the same result. Whether it is a 50/50 blend of *Brettanomyces* and *Saccharomyces*, or *Brett* first to start the fermentation and ale yeast to finish up, similar results can be attained as with 100 percent primary fermentation.

The fourth category of *Brett* beers is the more traditional method, where primary fermentation occurs from *Saccharomyces*, followed by a longer extended secondary with *Brettanomyces*. One of the best-executed examples is Ithaca Beer Company's Brute. Brewmaster Jeff O'Neil said the beer is primary fermented with their house *Saccharomyces* strain until the yeast stalls out with fermentable sugars still left. The beer is then transferred off the yeast and into a tank with a sizeable pitch of a very characteristic *Brettanomyces* strain. The *Brettanomyces* then finishes out the rest of fermentation, producing clean *Brett* characters with a fruity ester profile and a balanced tartness. The beer is then bottle-conditioned with Champagne yeasts.

This article focuses on the first two categories of *Brett* beers, as much of what occurs in primary fermentation with *Brett* can be used to draw upon when using it for hybrid and secondary fermentation.

All Brett, All the Time

The clean, 100 percent *Brett* fermentation is one in which no souring organisms or souring method is used. The term "clean fermentation" refers to the character of the finished beer, which lacks the classic barnyard aromas usually associated with *Brettanomyces*, but displays pronounced fruity ester aromas with little phenolic character. Clean, all-*Brett* beers tend to be perceived as very dry, and often need some other adjunct like fruit, hops, or spices to add complexity. Careful consid-

100% BRETTANOMYCES FARMHOUSE

Ingredients
for 5.25 U.S. gallons (19.87 L)

6.0 lb (2.72 kg) two-row pale malt
2.25 lb (1.02 kg) 10° L Munich malt
12.0 oz (340 g) rye malt
12.0 oz (340 g) wheat malt
8.0 oz (227 g) Simpsons Naked Golden Oats
8.0 oz (227 g) spelt malt
0.63 oz (18 g) Mt. Hood, 6% a.a. (FWH)*
0.17 oz (5 g) ground coriander (20 min)
0.35 oz (10 g) aroma hop of your choice (10 min)
0.17 oz (5 g) fresh citrus zest (5 min)
0.35 oz (10 g) dry hop of your choice (secondary)
Brettanomyces yeast

Original Gravity: 1.053 (13° Plato)
Brewhouse Efficiency: 70%
Boil Time: 90 min

Directions
Standard infusion mash. Rest till conversion, re-circulate, and sparge with water at 169° F (76° C). Aroma hop of your choice. Can go American citrusy or German noble hop. Dry hop for some citrus or to add more aromatics.

Mini-mash version: Substitute 2.8 lb (1.3 kg) pale liquid malt extract for 4 lb (1.8 kg) of the two-row malt. Substitute 0.5 lb (227 g) liquid wheat malt extract for the wheat malt. Substitute 1.5 lb (680 g) liquid Munich malt extract for the Munich malt. Mash the rye, spelt, and oats with 2 lb (0.9 kg) of two-row malt at 151° F (66° C) for 60 minutes. Strain and sparge. Add malt extracts, bring to boil, and proceed with recipe as written.

*FWH=first wort hops

100% BRETTANOMYCES BELGIAN WHITE

Ingredients
for 5.25 U.S. gallons (19.87 L)

6.5 lb (2.95 kg) two-row pale malt
1.5 lb (0.68 kg) wheat malt
1.0 lb (0.45 kg) 10° L Munich malt
1.0 lb (0.45 kg) acidulated malt
8.0 oz (227 g) Simpsons Naked Golden Oats
6.4 oz (181 g) flaked barley
0.63 oz (18 g) Mt. Hood, 6% a.a. (FWH)*
0.17 oz (5 g) ground coriander (20 min)
0.17 oz (5 g) ground orange peel (20 min)
0.35 oz (10 g) aroma hop of your choice (10 min)
0.17 oz (5 g) fresh citrus zest (5 min)
0.35 oz (10 g) dry hop of your choice (secondary)
Brettanomyces yeast

Original Gravity: 1.053 (13° Plato)
Brewhouse Efficiency: 70%
Boil Time: 90 min

Directions
Standard infusion mash. Rest till conversion, re-circulate and sparge with water at 169° F (76° C). Aroma hop of your choice. Can go American citrusy or German noble hop. Dry hop for some citrus or to add more aromatics.

Mini-mash version: Substitute 3.5 lb (1.6 kg) pale liquid malt extract for 5 lb (2.25 kg) of the two-row malt. Substitute 1.0 lb (454 g) liquid wheat malt extract for the wheat malt. Substitute 0.66 lb (300 g) liquid Munich malt extract for the Munich malt. Mash the oats and barley with 1.5 lb (0.68 kg) of two-row malt at 151° F (66° C) for 60 minutes. Add the acidulated malt. Strain and sparge. Add malt extracts, bring to boil, and proceed with recipe as written.

*FWH=first wort hops

eration in recipe formulation and choice of malt/adjuncts can also aid in increasing the perceived mouthfeel.

In our "Wild Wild Brett" series of 100 percent *Brett* beers at Crooked Stave Artisan Beer, we use a combination of flowers, herbs, fruit, and/or spices to add depth and complexity to the beer while enhancing the mouthfeel. Specialty malts can also be used to provide similar depth and complexity, for example in a big, malty Baltic Porter. While the initial period of fermentation will generally finish in two to three weeks, no considerable amount of acetic acid is produced, and the beer shows off the delicate fruity esters characteristic of *Brettanomyces*-fermented beers. Any perceived tartness comes from the minimal organic acids produced by the Brett, and in most cases is completely absent.

A clean, 100-percent *Brett* beer can be brewed from a variety of base beers, from your favorite Belgian white recipe or even an IPA. With a little bit of recipe reformulation, you can create a *Brettanomyces* rendition of one of your classic favorites.

The second category of primary fermented *Brett* beer closely resembles some sour ales with a dominant yet clean *Brett* character up front. There are a variety of ways to incorporate a tart character into the beer, sometimes starting even before fermentation. Vinnie Cilurzo, brewer and owner of Russian River Brewing Company in Santa Rosa, Calif., perceived a lack of depth in flavor and a one-dimensional character in the early batches of Sanctification, Russian River's 100 percent *Brett* beer. Cilurzo now uses a blend of different *Brett* strains and inoculates with *Lactobacillus* and *Pediococcus* upon bottling, imparting a greater array of flavors and aromas. At Crooked Stave, we produce our golden sour, L'Brett d'Or, in a similar manner, finding that more strains add complexity during primary fermentation. Once primary fermentation is finished, we cold-crash the beer and rack it into barrels where a blend of *Lacto* and *Pedio* is added. The beer retains the initial *Brett* character while picking up a citrusy, sour character.

For homebrewers, this could mean that the primary fermentation is conducted in one carboy before racking the beer off the *Brett* yeast cake once fermentation finishes up and then transferring into another carboy, where *Lacto* and/or *Pedio* is added. An alternative method, which we employ at Crooked Stave in our year-round Petite Sour, is pre-acidifying the wort with lactic acid bacteria and then pitching *Brett* after a few days. For homebrewers who don't want to add bacteria to their carboys and transfer it through their hoses, conducting a sour mash is a complex way to produce a controlled amount of lactic acid before killing the bacteria during the long boil.

A less complicated method used by brewers with great results is adding up to 15 percent acidulated malt—a good source of lactic acid bacteria—to the grist. Thomas Kraus-Weyermann of Weyermann Malt has suggested that adding roughly a half cup of ground acidulated malt during fermentation can help the beer develop a nice lactic acidity over time. A study conducted in 2010 on pure culture fermentation characteristics showed better overall attenuation in a greater range of *Brettanomyces* strains when lactic acid was present at the onset of fermentation.

Whether it is for attenuation or to add depth and flavor, producing sour or tart *Brett* beers through primary fermentation is an alternative to the long-aged traditional sours.

For both types of primary fermentation, recipe formulation and strain selection

100% BRETTANOMYCES BALTIC PORTER

Ingredients
for 5.25 U.S. gallons (19.87 L)

5.0 lb (2.27 kg) two-row pale malt
7.25 lb (3.3 kg) 10° L Munich malt
1.0 lb (0.45 kg) Simpsons Naked Golden Oats
12.0 oz (340 g) 60° L crystal malt
12.0 oz (340 g) Special B malt
5.28 oz (150 g) chocolate malt
5.28 oz (150 g) Carafa II malt
0.88 oz (25 g) Glacier, 6% a.a. (FWH)*
0.53 oz (15 g) Glacier, 6% a.a (30 min)
Brettanomyces yeast

Original Gravity: 1.074 (18° Plato)
Brewhouse Efficiency: 70%
Boil Time: 90 min

Directions
Standard infusion mash. Rest till conversion, re-circulate and sparge with water at 169° F (76° C).

Mini-mash version: Substitute 2.8 lb (1.3 kg) pale liquid malt extract for 4 lb (1.8 kg) of the two-row malt. Substitute 0.5 lb (227 g) liquid wheat malt extract for the wheat malt. Substitute 4.8 lb (2.2 kg) liquid Munich malt extract for the Munich malt. Mash the oats and remaining grains with 1 lb (0.45 kg) of two-row malt at 151° F (66° C) for 60 minutes. Strain and sparge. Add malt extracts, bring to boil, and proceed with recipe as written.

*FWH=first wort hops

will play a large part in the final character of the finished beer. Given that most *Brett* strains do not produce the same level of mouthfeel that normal brewers' yeast will impart, careful attention should be paid when formulating the recipe.

Brewers often talk about the added benefits and contribution to mouthfeel when using grains such as rye, spelt, and oats. In each *Brettanomyces* beer we brew at Crooked Stave, we use some combination of these or other grains with the objective of adding complexity and mouthfeel. It doesn't take much—the recipes listed in this article give a good indication of what level is needed. Also important to note is that primary fermentation for both types of *Brett* beers should be undertaken in traditional glass or similarly-shaped plastic carboys with a small top opening so a tight top seal can be maintained. Primary fermenting *Brett* strains benefit from the same levels of aeration prior to the onset of fermentation as *Saccharomyces* strains do. It is important to minimize oxygen uptake after the onset of primary fermentation and throughout conditioning/aging.

When homebrewing with *Brett*, carboys can be filled 85-90 percent with wort before pitching the yeast, as *Brett* yeast tends to be more bottom fermenting and doesn't produce a large kräusen. It is important to monitor the primary fermentation. While primary fermentation will generally take a 1.060 (15° Plato) wort down to 1.012 or 1.010 (3-2.5° Plato) in two to three weeks, a lag phase is generally seen with the gravity dropping as low as 1.004 (1° Plato) over the next four to six weeks depending on the strain and brewing techniques. If bottling, it's important to take this into consideration, while kegging can happen earlier with excess pressure easily monitored and controlled.

Brett Strain Selection

Depending on the strain used, flavors and aromas will vary from tropical fruit to green apple, to metallic and earthy, but almost always the beers are perceived as dry. Some strains are better primary fermenters than others, with many homebrewers reporting good results with *Brettanomyces claussenii*. At Crooked Stave, we exclusively use a range of *Brettanomyces bruxellensis* strains for primary fermentation. Regardless, we have found the most important factor in getting a complete fermentation with an already well-attenuating strain is to have a healthy, adequate pitch. While we use ale pitching rates, we are harvesting from fermenters and repitching our *Brett* yeast, with the knowledge that it is at a healthy stage and ready for another strong fermentation.

When homebrewing with *Brett*, it is advisable to propagate store-bought vials or smack packs. Unlike *Saccharomyces*, *Brettanomyces* cannot reach adequate cell mass and proper cell physiology in only a few days' time. Cell growth takes between six to eight days with the various *Brett* strains, and it is recommended to let the starter propagate for a week before pitching into a primary fermentation. While ale pitching rates are generally advised, one-and-a-half times those rates or closer to lager pitching rates could yield better results for homebrewers.

Brett beers can easily be adapted into any home brewery. While long-aged sour beers can cause some homebrewers to shy away, *Brettanomyces*-fermented beers can be produced more quickly and pose less of a threat to equipment than the bacteria involved in sour brewing. If you haven't already brewed a 100 percent *Brett* beer or are looking for new ideas, give the recipes a try and hopefully you'll be hooked on these new and creative beers.

Chad Yakobson is the owner and brewer of Crooked Stave Artisan Beer Project in Denver, Colo. After initially studying winemaking in New Zealand, Chad switched his focus to the brewing industry, concentrating on various microorganisms present during the barrel-aging of sour beer. In 2010, he completed his master's thesis, "Primary Fermentation Characteristics of *Brettanomyces* Yeast Species and Their Use in the Brewing Industry," and was awarded a Master of Science in Brewing and Distilling from Heriot-Watt University and the International Centre for Brewing and Distilling in Edinburgh, Scotland.

SECRETS OF GLUTEN-FREE BREWING

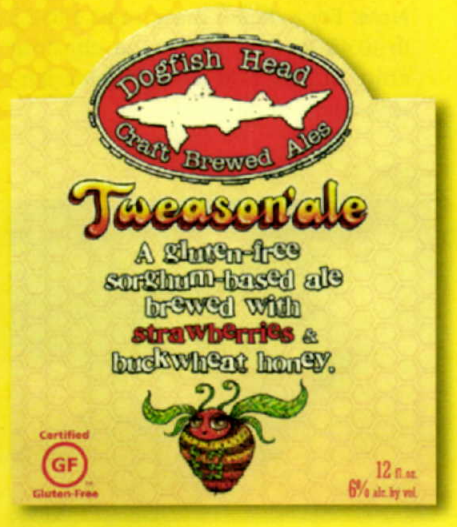
BY CAROLYN SMAGALSKI

Sam Calagione, founder of Dogfish Head Craft Brewery, has been creating "off-centered ales for off-centered people" since 1995. Most would agree that his beers are not only off-centered, but also on the edge of insanity. His rock star status among beer lovers is no accident.

Collaborations with Patrick McGovern, a scientific director at the University of Pennsylvania Museum in Philadelphia, have yielded ancient ales using Muscat grapes, chrysanthemum flowers, zatar, annatto, and saffron—ingredients found in vessels of antiquity from early Egyptian tombs and exotic sites in central China and Honduras. Calagione has crafted beers fermented in rare Paraguayan Palo Santo wood and barleywines made with agave nectar and Aaron's rod. And what about chicha, crafted with South American maize and human saliva? In a world of extremes, Calagione is a renegade.

Now this renegade has entered the domain of gluten-free beer with Tweason'ale, a Champagne-esque beer brewed with sorghum, buckwheat honey, a touch of molasses, and locally sourced strawberries. "The number one request for a new beer is for an off-centered take on a gluten-free beer—one that has unique ingredients and a lot of flavor," Calagione explained when asked why Dogfish Head has run head-first into the scrum.

Gluten-free beer has come a long way since Heineken Italy's Bi-Aglut entered the field in 1999 with its soapy, edgy sourness. When Lakefront Brewery's New Grist won a gold medal in the Experimental category at the 2006 Great American Beer Festival (GABF), gluten-free beer was ready for the spotlight. Sprecher, Deschutes, Dock Street, and Anheuser-Busch began dabbling in gluten-free ingredients, supercharged with bananas, roasted chestnuts, sorghum syrup, and honey. The Alchemist in Vermont earned stardom when it won both gold and bronze medals at the 2009 GABF, for Celia Framboise and Celia IPA, respectively, then repeated



GLUTEN FREE CHESTNUT BEER

Recipe courtesy of Lee Williams, Trails End Chestnuts

Chestnuts have essentially the same nutritional content as malted barley except that the sugars are not as readily available. Amylase breaks down the starches and sugars to a fermentable level.

Ingredients
for 5 U.S. gallons (18.93 L)

5.0 lb (2.27 kg) roasted, dried chestnut chips
5.0 lb (2.27 kg) dextrose
1.0 oz (28 g) Fuggles 5% a.a. (30 min)
1.0 oz (28 g) Cascade 6% a.a. (steep 30 min)
Lallemand Windsor brewing yeast
Amylase powder
1.0 oz (28 g) 100 bloom type B gelatin (secondary)

Boil Time: 60 min
Original Gravity: 1.049-1.053
Final Gravity: 1.012-1.016
ABV: 4.8-5.0%

Note: For a darker brew, roast 1 to 1.5 lb (0.45 to 0.68 kg) of the chestnut chips at 350° F to desired color, stirring every 10 minutes.

Directions
Put about 5 gallons of room temperature water in a pot and add one tablespoon of amylase that has been dissolved in one cup of water per manufacturer's directions. Place chips in a grain bag and steep in 7 gallons water for a minimum of 12 hours. During this time raise and lower the bag five to six times every hour or so to obtain maximum sugar extraction. During the soaking and extraction process, the chips will absorb and retain about 3-4 quarts of the water. At the end of the soak, you should end up with an amber-colored wort with a gravity of 1.016-1.020. Remove grain bag and drain thoroughly. Top off to 5 gallons (18.93 L).

Bring wort to a boil. Add Fuggles in a hop bag and continue to boil for another 30 minutes. Add dextrose and boil for 15 more minutes. At this time the gravity is usually 1.049-1.053. Remove from heat and steep Cascade in a hop bag for another 30 minutes. Remove hops and chill to pitching temp. Rack to fermenter, pitch, and ferment at ambient temperatures, usually a little over three days. Once fermentation is complete, rack to secondary and add 1 ounce of 100 bloom type B clarifying gelatin as per manufacturer's instructions. Mix thoroughly, clarify three to four days. Bottle or keg as usual.

the performance, clinching golds at the 2010 GABF and 2010 World Beer Cup with two additional styles.

This was good news for individuals with celiac disease, a condition characterized by the body's intolerance for the glutens in barley, wheat, spelt, rye, oats, and similar grains. Statistics reported at the National Institutes of Health and the Archives of Internal Medicine indicate that 1 in 133 people have celiac disease. Newer studies estimate that up to 1 percent of the population may have the condition.

Offending glutens, referred to as peptides or prolamins in the scientific community, cause nutrient-absorbing fibers in the small intestine to atrophy, making them unable to function in the digestive process. Short-term effects are numerous, including abdominal bloating, unexplained anemia, bone and joint pain, and infertility. Long-term exposure may result in osteoporosis, dental enamel defect, malnutrition, type 1 diabetes, intestinal cancers, and premature death. For some celiac sufferers, damage occurs despite the lack of visible symptoms, a condition called the "celiac iceberg."

Exposure to gluten can even result in "celiac crisis," a life-threatening condition that affects a small number of celiac sufferers. The individual suffers excessive diarrhea, followed by hypokalemia (a lack of potassium) and acidosis (excess acid in body fluids). This condition can be fatal without immediate medical treatment.

Gluten-Free Debate

Commercial breweries have recently introduced "low-gluten" products to the celiac-centric market. These beers are made with barley, but claim to be rendered safe for celiac sufferers due to processing. Under extreme scrutiny, these beers are at the center of an international debate regarding their safety among the gluten-intolerant population.

Dr. Matthew Morell, theme leader for the Future Grains, Grain-Based Foods and Feed Research Program within Australia's national science agency, led a 2011 study called "What is in a Beer? Proteomic Characterization and Relative

Quantification of Hordein (Gluten) in Beer." (Hordein is a prolamin glycoprotein, present in barley and some other cereals, that comes under the general name of gluten.)

In this study, published by the American Chemical Society, mass spectrometry was used to measure *digested* prolamins in 60 commercially available beers. Eight of the beers were brewed using sorghum malt, teff, rice, millet, or maize. Labeled "gluten-free," these beers were indeed free of gluten proteins.

Two beers were "hordein deletion beers," brewed with barley, but processed to remove harmful glutens. Enzyme Linked ImmunoSorbent Assay (ELISA) tests documented gluten levels below 10 ppm, but mass spectrometry showed the relative hordein content in these beers matched the levels in regular, barley-based beers. Current ELISA testing methods measure *intact* proteins rather than digested proteins. These tests are effective in detecting gliadins and glutenins in beer, but may fail to effectively identify hordeins found in barley. Currently, Europe's Codex Alimentarius (food code) has approved only one standard test to identify glutens in beer, but the accuracy of this test is under challenge by independent laboratories.

Dr. Morell cautions that the mass spectrometric assay developed by his team needs further evaluation and validation by other facilities. "Eventually we aim to extend this work to include other forms of gluten, such as that found in wheat and rye," he commented.

Two Dutch studies of *Aspergillus niger* prolyl endoprotease (AN-PEP) indicated that this enzyme may neutralize gluten proteins entering the body, although one study only tested for gliadins and glutenins. They did not measure hordein, avenin, or secalin levels. Brewers Clarex™, developed by DSM Food Specialties, is a clarifying agent developed with the AN-PEP enzyme. This product may alter the glutens in barley-based beer, but *caution must be used until more conclusive testing is done*. White Labs offers the product under the name Clarity-Ferm. (For

BELGIAN SPICE ALE

Recipe courtesy of Aaron Fournier

Ingredients
for 5 U.S. gallons (18.93 L)

6.6 lb (3 kg)	Briess sweet white sorghum syrup
1.0 lb (0.45 kg)	D-90 dark candi syrup
0.07 oz (2 g)	cracked paradise seed (15 min)
0.25 oz (7 g)	cracked coriander (15 min)
1.0 oz (28 g)	Styrian Goldings 6% a.a. (60 min)
1.0 oz (28 g)	Styrian Goldings 6% a.a. (10 min)
	Safale T-58 yeast

Boil Time: 60 min
Original Gravity: 1.060

Directions
Bring 1.5 to 2 gallons (5.68 to 7.57 L) of water up to a boil. (Keep enough head space to avoid boil-overs). Remove from heat, add sorghum syrup, and stir to dissolve. Commence boil, adding hops and spices at specified intervals. After a 60-minute boil, turn off heat, remove from burner, and add dark candi syrup. Chill, top up to 5 gallons, and pitch yeast. Ferment at 65-70° F (18-21° C) for up to two weeks. Rack to secondary for better clarity. Bottle or keg as usual.

more on this topic, see Charlie Papazian's World of Worts column in the November/December 2009 *Zymurgy*).

Gluten-Free Homebrewing

Brewing with alternative grains presents a challenge for homebrewers used to brewing with barley and wheat. But sorghum brewing is not a new concept. Forty varieties of sorghum and millet were domesticated in Egypt 2,000 years before the cultivation of barley and wheat. In fact, sorghum remains the most common grain for brewing African beers today.

Sorghum beer, with its sharp, acidic profile, has a distinctive flavor uncommon in sweeter, barley-based beer. To compensate, commercial brewers frequently blend sorghum with other grains or add buckwheat honey, nuts, and fruit to the wort. Some have accented the sour profile by fermenting with Belgian yeast. Others bump up the assertiveness of the hops. While at Dock Street Brewery in Philadelphia, Ben Potts refreshed the recipe for Sudan Grass Ale by adding honey to make it mead-like, and used hibiscus as the main flavoring botanical. "I ended up working with Pat McGovern in putting together a group of spices all native to the African continent," he said.

Michael Plungis, a homebrewer based in Littleton, Colo., designed a beer for his wife after she was diagnosed with gluten intolerance.

"I started making it for others who had celiac including her family, co-workers, neighbors, and finally my wife's doctor, who has over 200 celiac patients," said Plungis. "He really liked it and asked if I could make it for his patients. "

Plungis approached Tim Myers at Strange Brewing Company in Denver, who collaborated with him to produce Gluten Free Lemon Pale. This "Strange" beer went on to win a gold medal at the Great American Beer Festival in 2011. That recipe is under wraps for now as Plungis is in the process of starting his own gluten-free brewery.

Secrets of the Renegade Gluten-Free Brewer

1. Avoid barley, wheat, rye, spelt, and oats.

Sorghum brewing is not a new concept. Forty varieties of sorghum and millet were domesticated in Egypt 2,000 years before the cultivation of barley and wheat. In fact, sorghum remains the most common grain for brewing African beers today.

Oats that are certified gluten free are generally safe, but the National Foundation for Celiac Awareness estimates that "one in five persons with celiac disease will also have a reaction to oats" due to an offending protein, avenin.

2. Use acceptable grains. Try mixing them with nuts or fruit for complexity.
The most common are sorghum, buckwheat, corn (maize), wild rice, chestnuts, honey, millet, and quinoa.

3. Use yeast that has been certified gluten-free.
Look for yeast that has been grown on sorghum, beet molasses, whey (from milk), cane sugar, corn syrup, maltodextrin (usually made from corn), potato starch, sugar cane sap, or sugar beets. Lallemand Inc. produces yeast under the names of Danstar (beer yeast) and Lalvin (wine yeast) that are free of gluten. Their source is potato starch.

Fermentis uses molasses as a growth medium and creates yeast that is not genetically modified. The yeast are confirmed gluten free down to 10 ppm as required by EU standards. Tim O'Leary of Kettlehouse Brewing in Missoula, Mont., won a bronze medal at the 2011 GABF for Seeley Axe White. He insists on using yeast that is certified gluten free. "We made our first batch of Seeley Axe with yeast harvested off a barley-based beer," he explained. "Some of our celiac customers could not drink it, so we switched to dried yeast from Fermentis."

Wyeast Laboratories has developed 100% Pure Liquid Yeast™ in gluten-free form in Activator™ Pure Pitchable Yeast Packages, available to craft brewers by special order. They are available in American Ale and Bavarian Lager strains.

4. Adjust fermentability in wort.
Starch extraction can be difficult when making gluten-free beer using sorghum

QF PALE ALE

Recipe courtesy of Jason Harris, Keystone Homebrew Supply

Ingredients for 5 U.S. gallons (18.93 L)

6.6 lb (3 kg)	Briess sweet white sorghum syrup
1.0 lb (0.45 kg)	clover honey (knockout)
0.5 oz (14 g)	Cascade pellets 6% a.a. (60 min)
0.5 oz (14 g)	Citra pellets 12% a.a. (30 min)
0.5 oz (14 g)	Cascade pellets 6% a.a. (10 min)
0.5 oz (14 g)	Citra pellets 12% a.a. (knockout)
	Nottingham Ale Yeast
	Irish moss or Whirlfloc to clarify (15 min)
5.0 oz (142 g)	dextrose to prime

Boil Time: 60 min
Original Gravity: 1.059
Final Gravity: 1.013
ABV: 5.8%

Directions

Bring approximately 2.5 gallons (9.46 L) water to a boil. Remove the pot from the heat, add the sorghum, and stir to dissolve. Return to a boil and add hops, bagged, at specified intervals. Boil 60 minutes, remove from heat, and stir in honey and bagged finishing hops. Chill to pitching temp, rack to fermenter, top off to 5 gallons with cold water, and add yeast. Ferment at 65-70° F (18-21° C) for up to two weeks. Rack to secondary for better clarity. Bottle or keg as usual.

SEELEY AXE WHITE BEER

Recipe courtesy of Tim O'Leary, Kettlehouse Brewing Co., Missoula, Mont.

Ingredients for 5 U.S. gallons (18.93 L)

3.0 lb (1.36 kg)	Briess sweet white sorghum syrup
3.0 lb (1.36 kg)	brown rice syrup
1.0 oz (28 g)	maltodextrin
1.0 oz (28 g)	Nugget 13% a.a. (85 min)
1.0 oz (28 g)	dried bitter orange peel (10 min)
1 T. (12 g)	coriander, crushed (10 min)
1.0 oz (28 g)	Crystal 4% a.a. (knockout)
	Fermentis Safale US-05

Boil Time: 85 min
Original Gravity: 1.048

Directions

Bring 1.5 to 2 gallons (5.68 to 7.57 L) of water up to a boil. (Keep enough head space to avoid boil-overs). Remove from heat, add syrups and maltodextrin and stir to dissolve. Commence boil, adding hops and spices at specified intervals. After an 85-minute boil, turn off heat and add Crystal hops. Chill, top up to 5 gallons, and pitch yeast. Ferment at 65-70° F (18-21° C) for up to two weeks. Rack to secondary for better clarity. Bottle or keg as usual.

or nuts. Therefore, you may need additional sugars for the yeast to feed on. Use demerara sugar, invert sugar, molasses, lactose, maltodextrin, candi sugar, corn sugar, honey, or maple syrup. Avoid dextrose, which is made by breaking apart the starch molecules in grain (usually wheat).

5. Hops and water are naturally gluten free.

6. Brew in a gluten-free environment.
Avoid areas that may be cross-contaminated with malt dust from offending grains. Keep all ingredients for gluten-free beer in a separate storage area. Follow proper sanitation procedures. Wash aprons and clothing that has been exposed to gluten dust before wearing them to brew gluten-free beer.

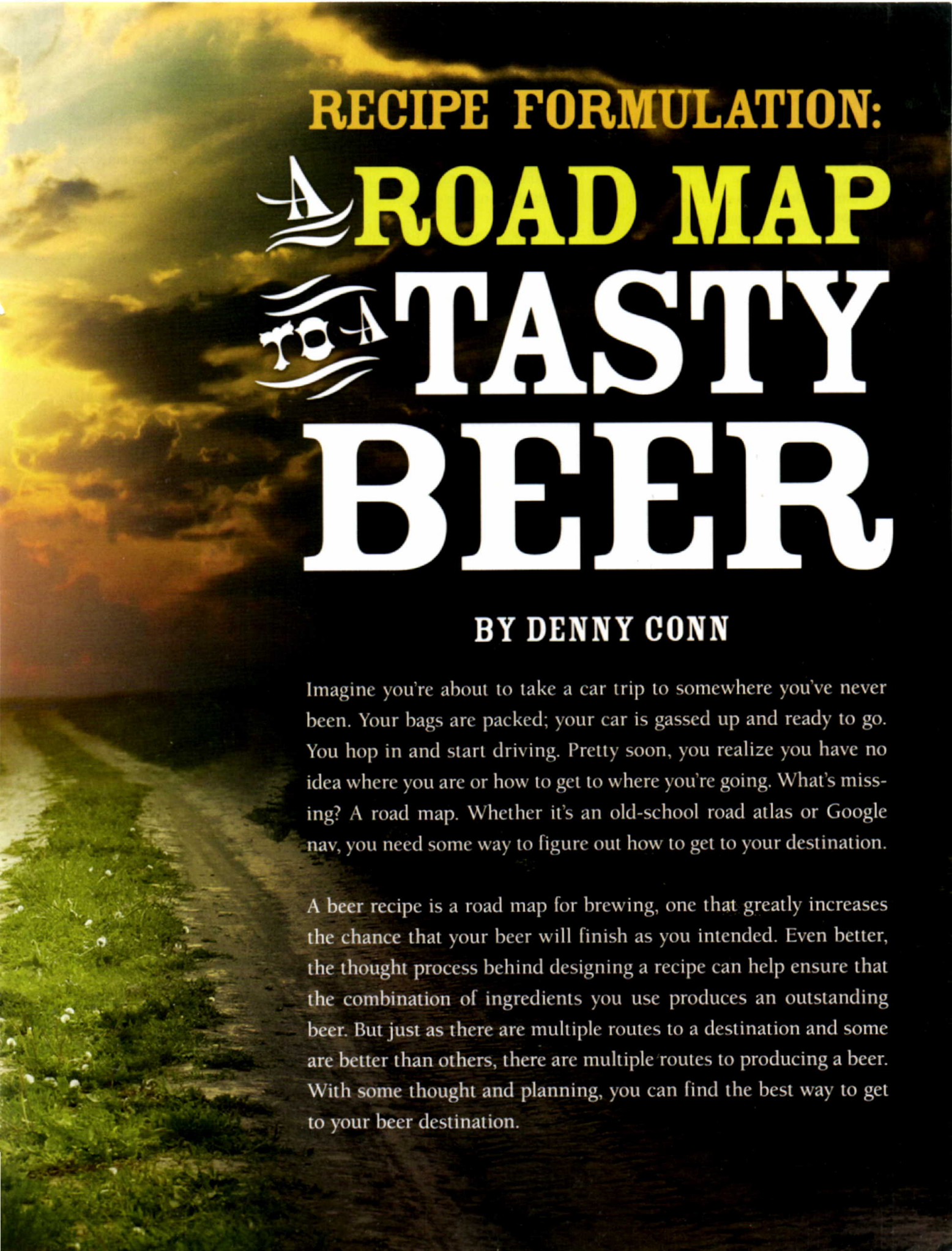
7. Marry the grain profile with complementary flavors.
Tart sorghum profiles are *softened* with honey, fruits, or the assertive use of hops. Experiment with Belgian yeast. Combine grains for a smoother grain profile.

Maybe the best advice, though, would be to keep expectations realistic for a gluten-free beer.

"The holy grail would be to brew a gluten-free beer that would taste like Sierra Nevada Pale Ale, or New Belgium [Fat Tire], or Zonker Stout, or Cold Smoke Scotch Ale," said Kettlehouse's O'Leary. "But that ain't gonna happen. So again, if you adjust your expectations, you may be surprised. I used to not like coffee or beer when I was a kid. Now I like both."

As beer and brewing advisor for the International Gluten Free Beer Festival, UK, freelance journalist and "Beer Fox" Carolyn Smagalski has been dedicated to the gluten-free beer community since 2005. She is the recipient of the 2006 Brewers Association Beer Journalism Award in Electronic Media for her work at BellaOnline and is a contributing author to the book, *Beer Hunter Whisky Chaser*. She co-founded the Philly Beer Geek Competition, serves as an international BJCP judge, and is a contributor to the Journal of the Society of Brewing History, UK.


PORTER
SAISON
IMPERIAL IPA
STOUT
BARLEYWINE



RECIPE FORMULATION: A ROAD MAP TO A TASTY BEER

BY DENNY CONN

Imagine you're about to take a car trip to somewhere you've never been. Your bags are packed; your car is gassed up and ready to go. You hop in and start driving. Pretty soon, you realize you have no idea where you are or how to get to where you're going. What's missing? A road map. Whether it's an old-school road atlas or Google nav, you need some way to figure out how to get to your destination.

A beer recipe is a road map for brewing, one that greatly increases the chance that your beer will finish as you intended. Even better, the thought process behind designing a recipe can help ensure that the combination of ingredients you use produces an outstanding beer. But just as there are multiple routes to a destination and some are better than others, there are multiple routes to producing a beer. With some thought and planning, you can find the best way to get to your beer destination.

TASTE IMAGINATION

Before you can figure out how to get there, you have to know where you're going. That's where "taste imagination" comes in. Being able to mentally "taste" the beer you want to create gives you a target for your recipe. You won't just be throwing ingredients together to see what comes out (although that can be an interesting approach sometimes!).

I start designing a recipe by imagining what I want the finished beer to taste like. Is it balanced toward hops or malt? Is it light colored or dark? Are the flavors subtle or forward, straightforward, or complex and layered? Have I previously tasted a commercial or homebrewed beer that has some of the characteristics of the beer I want to create? Have I seen a recipe in a book or magazine that could contribute ideas? Does my imaginary beer contain elements of a BJCP style or something I've brewed before? As an example, here's the thought process I went through when formulating the recipe for my Bourbon Vanilla Imperial Porter.

- Christmas beer (something out of the ordinary)
- Bigger beer, both in gravity and flavor
- Darker style for winter…robust porter?
- Maybe even bigger…imperial porter?
- Big, rich porter, maybe with some chocolate notes
- Munich and crystal malts to add maltiness and sweetness, enhance and balance chocolate flavors
- Barrel aging? No time.
- Add "barrel" attributes such as vanilla and bourbon
- Make sure vanilla and bourbon integrate into beer, not overpower it

After that thought process, I consulted some recipe books and looked at various approaches to robust porter before I wrote down the basic recipe and started the process of fine-tuning it. It took about four test batches of the base porter before I came up with something I thought would work in combination with the other flavors I wanted to use.

BUILDING THE BOURBON VANILLA IMPERIAL PORTER

One of the most important things to work out was the hopping. With the rich, chocolate flavors I desired, I needed to make sure the hops would balance, but not overpower. I decided to use Magnum hops because although they're a high alpha hop, the low cohumulone level gives a fairly smooth, mellow bittering quality. I also kept in mind that adding the vanilla would increase the perception of sweetness in the beer. Knowing that I wanted the beer to be in the mid-80s for an OG, I started with the assumption that I wanted the bitterness to be around 50 IBUs.

When I tasted the first test batch brewed to that spec, it was a great porter, but I could tell that it had too much bitterness for what I had in mind. I added a couple more pounds of Munich malt and cut the IBUs back to the low 20s. That version was too sweet, even before the vanilla was added. I dropped a pound of Munich and upped the IBUs to the low 30s. That batch was just what I was looking for. Then I brewed exactly the same recipe again to be sure that it was repeatable.

Although I could have soaked the vanilla beans in bourbon to sanitize them, I hadn't yet decided on how much bourbon I wanted to use. I decided that between the low pH of the finished beer and the alcohol content, I'd just put the vanilla beans in the fermenter. I split them lengthwise and scraped out all of the "gunk" on the inside. That's where most of the flavor is. Then I cut the pods into two- to three-inch pieces and added the "gunk" and pieces to a secondary fermenter and racked the beer onto them. After about four days, I started tasting the beer to decide when to get it off the beans. Initially it was about 11 days, but I've discovered that the length of time will depend on how fresh the beans are. For this beer, you really need to sample as you go to make that decision.

I've also learned that the vanilla flavor and aroma are the first things to fade, so you want try to impart more initial vanilla flavor than you think it will need. Although some brewers have expressed concern about the effects of the oils in the beans on head retention, I've found them to have no negative effects at all. When it was done fermenting, I figured out the amount of bourbon using a post-fermentation trial process described later in this article. The goal was to make the bourbon an accent, not a key flavor in the beer. The chocolatey porter, vanilla, and bourbon needed to blend together into one coherent flavor, and not have each stand out on its own.

I often hear discussions about whether or not simple recipes are the best.

Art © Shutterstock

I can confidently say that they are... except for when they're not! There are no rules about how complicated your recipe should be. The end result is that it accomplishes the goal of creating the beer you have in mind. The key is to avoid needlessly adding ingredients that muddle the flavor of the beer. Make the recipe as complex as it needs to be, but no more. Think through each ingredient and ask yourself what it will bring to the beer. If you can't answer that question, either leave it out, or consider it an experiment to learn what that ingredient is all about. Think about balance between ingredients and how one will complement another when the flavors combine.

KNOW YOUR INGREDIENTS

Knowing the flavor components of the ingredients allows you to use your "taste imagination" to consider how they'll combine. There are many choices for learning about ingredient flavors. The easiest way is to just taste the raw ingredients. Chew on some malt. Rub some hops between your palms to break them up, and take a sniff. Take notes about what you detect so you can refer to them in the future.

Another way is to make a "SMASH" beer—Single Malt and Single Hop. By keeping the ingredients minimal, each will present its own flavor and aroma profile. For example, if you make a beer with only Munich malt, you'll be certain that any malt flavors you taste come exclusively from the Munich. The downside to doing that is that you'll need to brew a lot of batches to taste-test all the various ingredients out there. OK, so maybe it's not so much of a downside, but it will certainly take you a while to get through them all!

One way around that is to make "teas" with ingredients, steeping them in water to get an idea of flavor. This works great with grains or extracts, and maybe less well with hops. For grains, try putting 4 ounces of water in a cup in the microwave for a minute. It should heat up to about 170° F (77° C). Stir in 1.5 ounces of crushed grain (about four heaping tablespoons) and let the mixture sit for about 30 minutes to be sure you get conversion of the starches in the grain. You may need to reheat the mixture in the microwave once or twice during that time. I put it in for 30 seconds after 10 minutes and another 30 seconds after 10 more, then let it sit for the final 10 minutes. Pour the mixture through a coffee filter and let the liquid drain off. You'll be left with a couple of tablespoons of a sweet, malty liquid that really lets the flavor of the grain shine. Make sure to write down your impressions of the flavor and aroma so you can compare them to the next grain you try. Once you have an idea of the flavors of individual grains, try making a tea with a combination of grains to see how they work together.

JUST AS THERE ARE MULTIPLE ROUTES TO A DESTINATION AND SOME ARE BETTER THAN OTHERS, THERE ARE MULTIPLE ROUTES TO PRODUCING A BEER.

For hops, heat 4 ounces of water to 170° F (77° C) and add 2-3 grams of either whole or pellet hops. That's about one-third cup of whole hops or maybe a dozen pellets. Let the hops steep for about five minutes, then filter through a coffee filter. But beware—this is some seriously bitter, harsh, vegetal stuff. It's much more useful for comparing one hop variety to another than for actually getting the true flavor and aroma of a particular variety. You could, of course, make a small amount of wort using either grain or extract and steep the hops in that. It won't be as "challenging" to taste that way. But keep in mind that both the grain and hop flavor will change significantly during the actual brewing and fermentation process. Making a tea will only give you an approximation of what you'll get when you actually brew with the ingredients.

Fortunately, the aroma of a hop can tell you a lot about its flavor qualities. Take a hop cone or pellet, break it up, then rub it between your palms to release the volatile oils. Take note of the aroma. Is it flowery, earthy, woody, citrusy, dank? Try to come up with descriptors that mean something to you so when you think back on the hop, you can use it in your "taste imagination" recipe.

The final critical ingredient is yeast. You might use a strain of yeast that contributes little character of its own and lets the malt and hops shine through. On the other hand, you can use a Belgian or wheat yeast that will contribute notice-

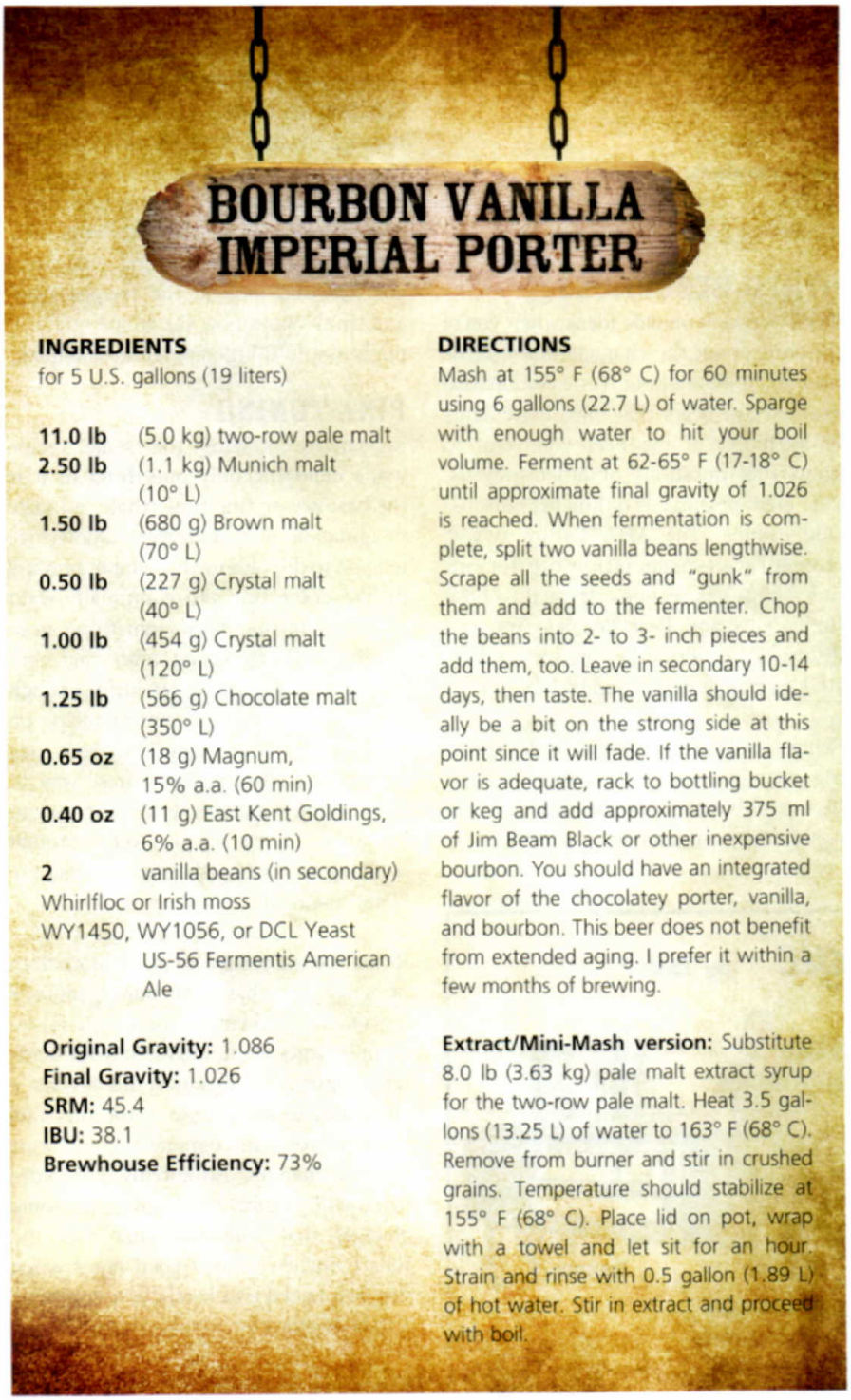
able phenolics and esters that will greatly influence the flavor (think clove, smoke, banana, plum, raisin), or perhaps a British yeast that adds subtle fruity and earthy flavors. Keep in mind that fermentation temperature also plays a part in the type and strength of the flavors and aromas from yeast. In general, fermenting at the low end of a particular yeast's temperature range will tend to give you more restrained flavors, while the high end of the range will emphasize those traits. While you need to account for these characteristics when you're planning your recipe, the only way to really learn them is to brew with the yeast. Darn, there's that "more brewing" thing again!

Another factor for all-grain brewers to take into account when designing a recipe is the mash schedule. Mash temperature (and to some degree length) has an effect on the body of the beer. In general, the lower the temperature and the longer the mash, the more fermentable the wort. That translates into a lighter bodied beer. For fuller body, use a higher temperature mash. Of course, grain, adjunct, and yeast choices will also influence the body to some extent, so think ahead and plan for the interaction of all these factors.

SUGARS AND FLAVORINGS

If you're adding sugar to your beer, it's a simple matter to taste it directly and think about what impact it will have on the finished flavor. Some sugars, such as cane sugar, beet sugar, or candi rock sugar, will have little flavor of their own and their impact on the beer will be minimal. Others, like honey, demerara, or piloncillo sugars, or some of the candi syrups, can have a major impact on flavor (depending on exactly how dark the syrup is). Dark syrups like D2 from dark-candi.com or D-180 from candisyrup.com can dominate the character of an otherwise light-flavored beer.

The great thing about sugars is that it's easy to taste them before brewing and think about how they may impact your beer flavor. The point at which you add the sugars in the brewing process can have an effect on the flavor you get from them, too, so take that into consideration. Generally, the later in the brewing



INGREDIENTS
for 5 U.S. gallons (19 liters)

11.0 lb	(5.0 kg) two-row pale malt
2.50 lb	(1.1 kg) Munich malt (10° L)
1.50 lb	(680 g) Brown malt (70° L)
0.50 lb	(227 g) Crystal malt (40° L)
1.00 lb	(454 g) Crystal malt (120° L)
1.25 lb	(566 g) Chocolate malt (350° L)
0.65 oz	(18 g) Magnum, 15% a.a. (60 min)
0.40 oz	(11 g) East Kent Goldings, 6% a.a. (10 min)
2	vanilla beans (in secondary)

Whirlfloc or Irish moss
WY1450, WY1056, or DCL Yeast US-56 Fermentis American Ale

Original Gravity: 1.086
Final Gravity: 1.026
SRM: 45.4
IBU: 38.1
Brewhouse Efficiency: 73%

DIRECTIONS
Mash at 155° F (68° C) for 60 minutes using 6 gallons (22.7 L) of water. Sparge with enough water to hit your boil volume. Ferment at 62-65° F (17-18° C) until approximate final gravity of 1.026 is reached. When fermentation is complete, split two vanilla beans lengthwise. Scrape all the seeds and "gunk" from them and add to the fermenter. Chop the beans into 2- to 3- inch pieces and add them, too. Leave in secondary 10-14 days, then taste. The vanilla should ideally be a bit on the strong side at this point since it will fade. If the vanilla flavor is adequate, rack to bottling bucket or keg and add approximately 375 ml of Jim Beam Black or other inexpensive bourbon. You should have an integrated flavor of the chocolatey porter, vanilla, and bourbon. This beer does not benefit from extended aging. I prefer it within a few months of brewing.

Extract/Mini-Mash version: Substitute 8.0 lb (3.63 kg) pale malt extract syrup for the two-row pale malt. Heat 3.5 gallons (13.25 L) of water to 163° F (68° C). Remove from burner and stir in crushed grains. Temperature should stabilize at 155° F (68° C). Place lid on pot, wrap with a towel and let sit for an hour. Strain and rinse with 0.5 gallon (1.89 L) of hot water. Stir in extract and proceed with boil.

process you add them, the more of their character you'll retain. Adding them late in the boil, or even to the fermenter, will generally let them come through more than if they were added earlier.

Note that moderate additions of sugar do not make beer sweet. At 10-15 percent of total fermentables, sugar will in fact have the opposite effect. Alcohol translates to a drying sensation on the palate, exaggerating bitterness and astringency. Higher amounts can lead to harshness, and too much may overtax the yeast. Keep this in mind when determining the amount of sugar to add.

Herbs and spices are usually added late in the boil, five to 10 minutes before flameout. Think carefully before adding them to a recipe. Just because you like to eat a pickle with a beer doesn't necessarily mean that a pickle beer will be great! But if you think that's what you want, sneak up on it. Start on the low side with herbs and spices. Brew a batch and assess it. Brew again and add or subtract herbs and spices based on what you tasted in the first batch. My experience is that these additions can be tricky, and this is where repeated test batches can really help.

Flavorings like liquor, fruit, coffee, chocolate, or flavoring extracts can be added at different points in the brewing process to produce different results. I feel like most of the ingredients in this category have no place in the kettle and should be added after primary fermentation. This allows alcohol-soluble flavors to integrate with the beer and gives yeast a chance to digest any sugars in the flavorings that might otherwise lead to uncontrolled fermentation in the bottle. It also gives you a chance to gauge the amount of flavoring before final packaging, remove any settled solids, and provides an opportunity for blending if added flavors are stronger than intended.

Fruit may benefit from freezing before it is added to the secondary fermenter. This helps break down cell walls and extract the most flavor. A general rule of thumb is to use 1 pound (0.45 kilogram) of fruit for each gallon of beer, but there are many considerations for the amount of fruit to add. A pound per gallon might be fine for some lighter-flavored or low acidity fruit; highly acidic and stronger-flavored fruits will probably require less. The grain bill should compensate for increases in acid and alcohol dryness that fruit can impart to finished beer. More specifics on brewing with fruit have been addressed in previous issues of *Zymurgy*, including "Brewing with Fruit" in the May/June 2010 issue.

If you feel the need to sanitize the fruit before adding, avoid heating it. That can set the pectin in the fruit and make a gooey mess in your beer. Many brewers will soak the addition in vodka to sanitize it. I usually depend on the alcohol content and low pH of the beer to keep things safe and just put the fruit in directly.

For coffee aroma, try "dry beaning"—adding 4 to 5 ounces (113-142 grams) of coarsely cracked coffee beans to the fermenter after the activity of primary fermentation has subsided. For coffee flavor (or herbs and spices, but nothing fermentable!), try adding them when you package the beer. Pour four 2-ounce (59-milliliter) samples of the beer (before adding your priming sugar if you're bottling). Add a different, measured dose of the flavoring to each sample and taste critically. Have someone else taste, too, so you can find a consensus amount. Then scale the amount of flavoring in the sample up to the size of your entire batch.

When using liquor as a flavoring, you can figure out the additional alcohol content with a simple equation. Multiply the amount of liquor you are planning to add by the alcohol content of the liquor. For example, if you add 500 ml of 80-proof (40 percent alcohol), you can think of it as 40 x .5 liters = 20 points. If you are adding it to a 5-gallon (19-liter) batch that is 7 percent alcohol, the beer already has 7 x 19 = 133 points. Add them together and you have 19.5 liters with 153 points, which works out to 153/19.5=7.85 percent alcohol in the final batch.

The formula is:

$[(ABV_{beer} \times volume_{beer}) + (ABV_{liquor} \times volume_{liquor})] / volume_{total} = ABV_{final}$

OTHER RESOURCES

Don't overlook outside ideas when you're thinking about the characteristics of the beer you're developing. Taste commercial examples of beers that have ingredients or attributes of the beer you want to brew. Ask questions of other brewers. One great resource is online beer discussion groups. The AHA Forum (www.HomebrewersAssociation.org/forum/index.php) has sections devoted to both Ingredients and Beer Recipes. You can discuss ideas with other brewers and get advice on ingredients and techniques.

Recipe books can help a lot in formulating your own recipe. Compare recipes in several books. Look for ingredients in common, or ingredients that don't seem to make sense. Analyze the reason for using each ingredient. Compare recipes between books. If what you have in mind falls into (or near) a BJCP category, look through the BJCP Style Guidelines (www.bjcp.org). You can get a good idea of the flavor, aroma, and body characteristics of a style. Compare those to what your "taste imagination" is telling you. Then go back and look at the recipes again and think about how the recipe might or might not fulfill the guideline examples.

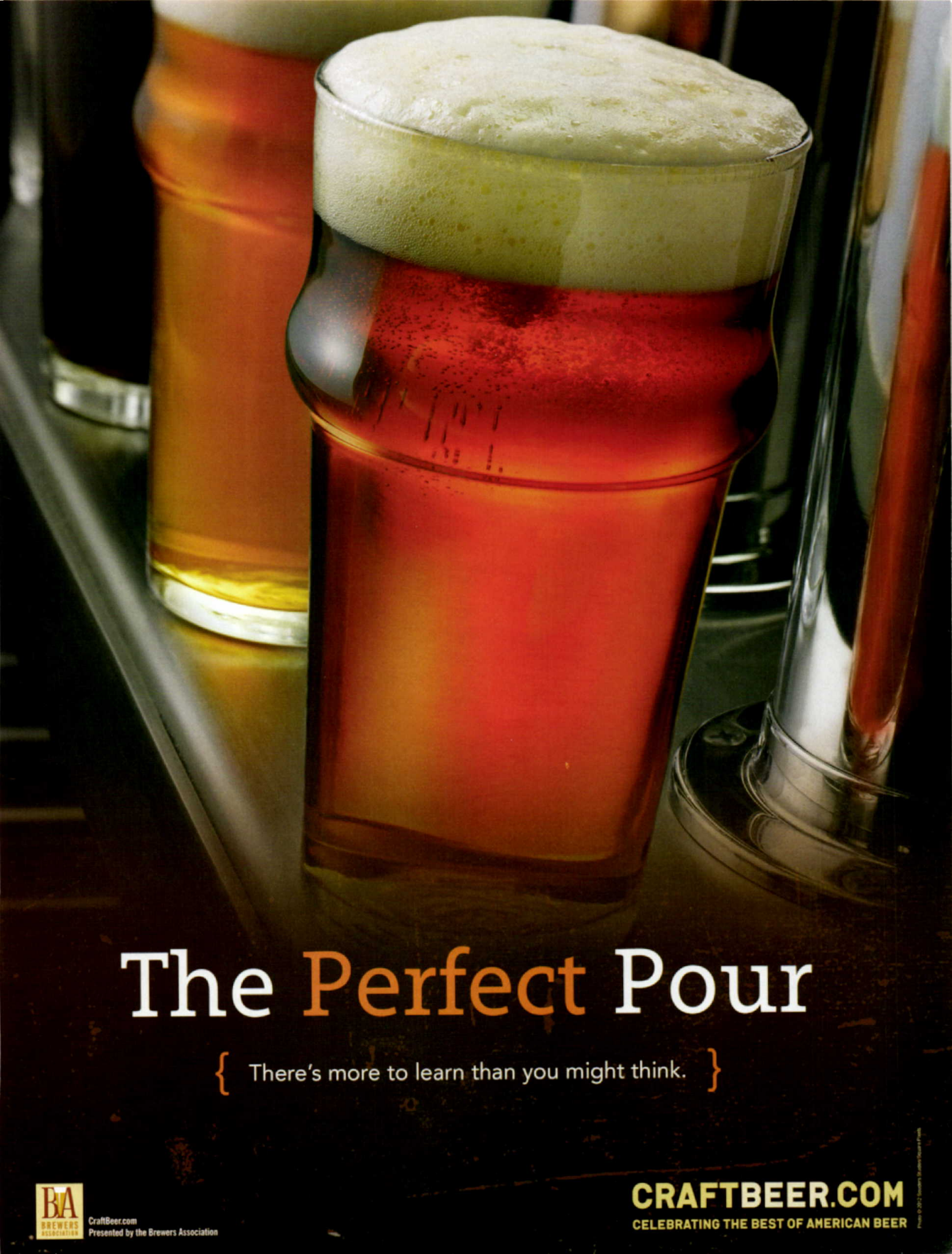
FINE-TUNING

Repeatedly brewing the same recipe while changing only one thing in it is the best way to fine-tune what your taste imagination and ingredient knowledge tell you to do. I know that a lot of brewers dislike doing this and continually want to move on and brew something new. There's nothing wrong with that, but unless you happen to get lucky enough to come up with your perfect recipe on the first try, re-brewing with only one change at a time is the surest way to home in on what you want your beer to be. Some of my recipes went through over a dozen test batches before I had the "Aha!" moment.

Resist the temptation to make more than one change in a batch. Try adding more or less of an ingredient, swapping one ingredient for another, or changing your mash temperature, for instance. It's always a good idea to keep some of the previous batch so you can compare ingredient or process changes. Admittedly, the older batch will possibly have undergone some changes that will somewhat alter the flavor, but if you took good notes when you first tasted that batch, you should be able to account for any flavor differences.

The result of all this thinking, imagining, and repeated brewing is a beer you can sit down with and say "I truly made this!" from concept to production. When someone compliments you on the beer, you can have the satisfaction of knowing that you're represented in every sip!

Denny Conn is a member of the Cascade Brewers Society and the AHA governing committee. He lives in Noti, Ore.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Evolution to Revolution:

American Aroma Hop Breeding

For centuries, while malt was celebrated as the "soul" of beer, hops were relegated to the simple rank of "spice," merely a secondary ingredient with subtleness as a requirement. These centuries marked a slow evolution of the hop from a wild herb to a refined, cultivated crop.

Things began to change in the late 20th century as a growing subculture of American beer drinkers emerged, thirsting for something out of the ordinary. To quench this thirst, these beer lovers began brewing for themselves. With many of the more successful of these pioneering homebrewers going commercial, the modern craft beer movement was born.

Around this same time, a handful of inconspicuous hop researchers in the Pacific Northwest of the U.S. were utilizing modern techniques to develop and release new hop varieties that tested long-held perceptions of hop aroma and flavor. These modern-day brewers and hop breeders inadvertently started a period of rapid change, and evolution gave way to revolution.

By Jason Perrault

Evolution of Hop Breeding

The first hop breeders were quite possibly medieval homebrewers or small batch monastic brewers. Unfortunately for them, the local homebrew supply store was non-existent, so they would have purchased brewing ingredients from neighbors, or quite commonly grew or wild-crafted their own. As a result, beer styles varied by region based upon several factors, including yeast strains and availability of malt and hops. With specific regard to hops, some plants were certain to produce more hop cones or perhaps provide better preservation and finer flavor than others, and as such these superior selections would have been prized.

As luck would have it, hops are a clonally propagated climbing bine, allowing early brewers and farmers to expand these prized plants via cuttings. As these superior cuttings gained in popularity, they would have been shared with neighbors. In this way, specific regions became associated with the hops they produced. Examples of this are especially evident in the traditional hop growing regions of Europe, where hop varieties with names such as Hallertauer, Tettnanger, Hersbrucker, and Saaz are still commonly grown. Through centuries of selection, these hops evolved to possess the defining characteristics we associate them with today.

Predictably, these genotypes were not adaptive to all environments. As a result, modern-day hop breeding began in earnest in the early 20th century. What set the modern breeders apart from their brethren of yore was their improved understanding of trait heritability, which allowed them to make crosses toward a predetermined goal with some level of predictability. They were also the first to select for traits of interest in controlled experiments, which enabled them to further exploit the inherent genetic complexity of the species.

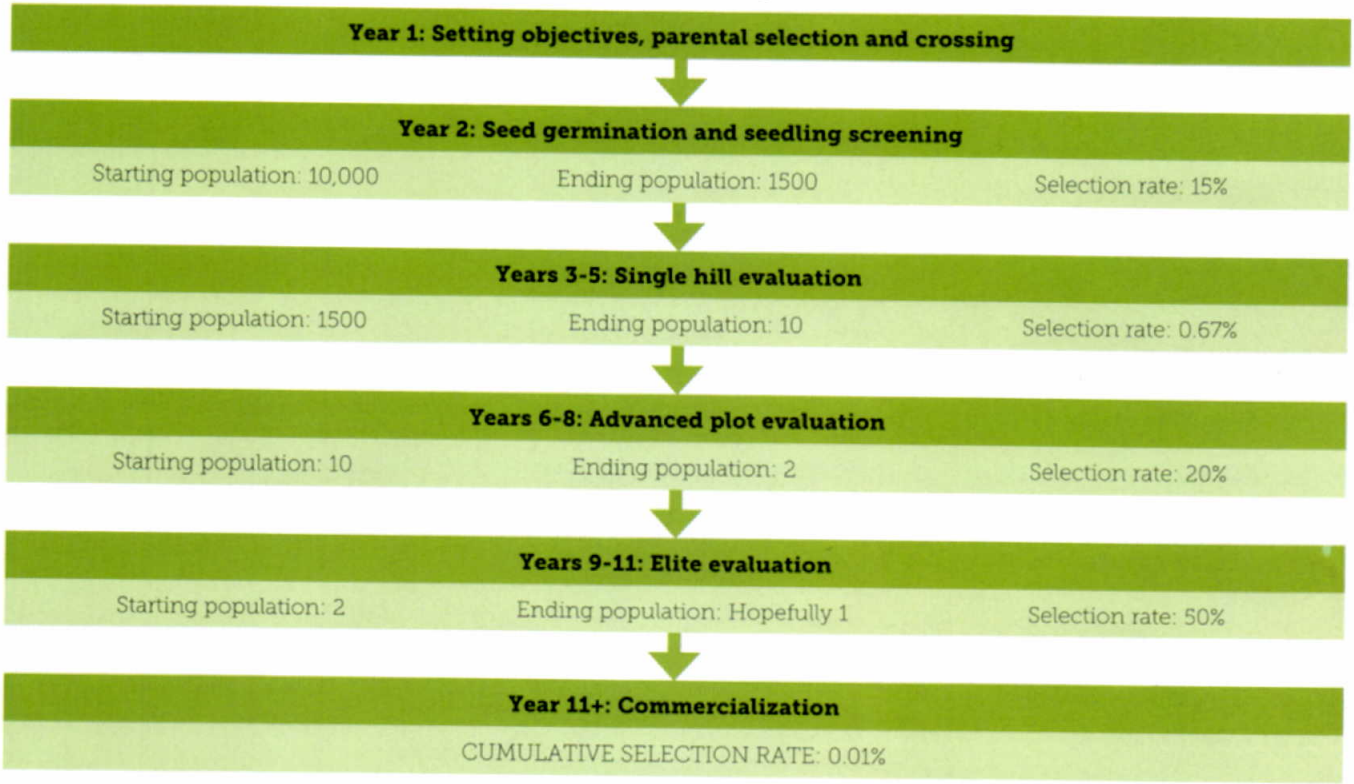
The goals of the first modern aroma hop breeders stayed consistent until the end of the 20th century. By utilizing a mix of indigenous American and domesticated European breeding lines, breeders in the Pacific Northwest adapted new varieties to mimic the mild nuances of spicy, herbal, citrus, and earthy found in the traditional "noble" aroma hops. By the early 1990s, these efforts had yielded some great results, including varieties such as Cascade, Willamette, Mt. Hood, Crystal, and Liberty. These "neo-classics" all fit the mold of a continental hop quite well, with the exception of Cascade, which was decidedly less refined.

One could easily argue that Cascade has influenced the direction of both craft brewing and aroma hop breeding in the U.S. more than any other hop variety. Released in 1972, it was developed as an aroma hop with Fuggle and Russian Serebrianka in its background. The aroma and flavor from Cascade was an instant classic with early hop heads. It was uniquely American, much like the brewers themselves. As a result, Cascade found widespread use among craft brewers. In an ironic twist, Cascade's popularity resulted in it becoming conventional to some. By the late 1990s, many craft brewers wanted something more, and breeders were ready to take up the cause. Thus began the next era in hop breeding.

A Revolution in Hop Breeding

The last 15 years have seen some major shifts in breeding objectives. Noble hops as well as "super" alpha hops remain a

Figure 1: *Typical hop breeding process by stage and year, including associated selection rates.*



major component of the world hop market, but the rapid expansion of the U.S. craft industry has created a whole new category of hop breeding geared toward special aromas. Consumers are increasingly demanding hop-forward and dry-hopped beers. As a result, new hop varieties like Ahtanum™ (YCR 1 cv.), Simcoe® (YCR 14 cv.), Amarillo® (VGXP01 cv.), and Citra® (HBC 394 cv.) have seen great success in brewers' quests to develop new and exciting flavors and aromas.

This leaves the breeder to ponder a few questions. New and exciting...what does this even mean? Who decides what is exciting? Will it still be exciting in a few years? Considering that a complete breeding cycle takes more than 10 years to complete, these questions are nearly impossible to answer with certainty, but with a properly designed breeding scheme, the risk is at least manageable.

With a 10-year development process, hop breeders are, in effect, aiming at a moving target that has been placed a considerable distance away. The tools available to the breeder to compensate include knowledge, technique, and numbers. Knowledge of breeding stock genetics, horticultural characteristics of the species, and of course customer needs is absolutely critical. Technique refers to the methodology of moving selections through the breeding process. Efficiency is critical, as classic breeding is a numbers game. The more offspring one can evaluate, the better the chances for success. Figure 1 illustrates how selections move through a typical breeding program using a starting population of 10,000 individuals as an example. The following summarizes each of these stages in more detail.

Year 1: Setting objectives, parental selection and crossing.

Breeders use all the information at their

Table 1: *Summary of U.S.-bred aroma hop varieties. This is by no means exhaustive, but provides a good summary of the evolution of variety releases.*

Variety	Year of Release	Pedigree Notes	Aroma	Total Oils	Alpha	Beta
The "Neo-Classics": Most often bred to be "noble" types.						
Cascade	1972	Fuggle/Serebrianka	Floral, citrus	0.7 - 1.4	4.5 - 7.0	4.8 - 7.0
Willamette	1976	Triploid derived from Fuggle	Mild, slightly spicy, some citrus	1.0 - 1.5	4.0 - 6.0	3.0 - 4.5
Mt. Hood	1989	Triploid derived from Hallertauer	Mild, spicy	1.2 - 1.7	4.0 - 7.0	5.0 - 8.0
Centennial	1990	50% Brewer's Gold	Floral, citrus	1.5 - 2.3	9.5 - 11.5	3.5 - 4.5
Liberty	1991	Triploid derived from Hallertauer	Slightly spicy	0.8 - 1.2	3.0 - 5.0	3.0 - 4.0
Crystal	1993	Triploid derived from Hallertauer	Spicy, floral	1.0 - 1.5	3.5 - 4.5	4.5 - 6.5
Ultra	1995	Triploid derived from Hallertauer	Mild, Saaz-like	0.5 - 1.0	2.0 - 3.5	3.0 - 4.5
Santiam	1997	Triploid derived from Tettnanger and Hallertauer	Herbal, noble	1.3 - 1.7	5.5 - 7.0	7.0 - 8.5
Sterling	1998	Saaz, Cascade, Brewer's Gold	Herbal, spicy, some floral and citrus	1.3 - 1.9	6.0 - 9.0	4.0 - 6.0
Palisade®, YCR 4 cv.	2003	50% Tettnanger	Spicy, floral, earthy	1.4 - 1.6	6.0 - 9.0	6.0 - 9.0
The "New Generation": In contrast to their predecessors, valued for uniqueness.						
Ahtanum™, YCR 1 cv.	1997	50% Fuggle, 50% unknown	Floral, citrus	0.8 - 1.2	5.5 - 6.5	5.0 - 6.5
Amarillo®, VGXP01 cv.	2000	Unknown	Floral, citrus (orange)	1.5 - 1.9	8.0 - 11.0	6.0 - 7.0
Simcoe®, YCR 14 cv.	2000	Open pollination	Intense, pine, citrus (grapefruit)	2.0 - 2.5	12.0 - 14.0	4.0 - 5.0
Citra®, HBC 394 cv.	2008	50% Hallertauer, 25% US Tettnanger	Citrus (lime), fruity/tropical-lychee, gooseberry	2.2 - 2.8	11.0 - 13.0	3.5 - 4.5
Experimentals: These hops have reached the final stages of testing, but full commercialization is dependent on customer acceptance.						
HBC 342	NA	Open pollination	Citrus, pineapple, melon	1.0 - 1.5	12.0 - 15.0	4.5 - 5.5
HBC 369	NA	50% YCR 14 (Simcoe), 25% Nugget	Complex, floral, earthy, citrus, fruity - tropical, blueberry	1.3 - 2.0	11.5 - 13.5	3.0 - 4.0

disposal to determine crossing goals. These will be based upon current market demand, projections, and direct input from brewers. Selecting the proper parents insures the breeder is maximizing the probability of success. Parents are selected based upon traits of interest and their breeding potential. This process is complicated by the fact that hops are dioecious, meaning there are separate male and female plants.

Crosses are performed via pollination of the selected female with pollen from a selected male. While natural pollination relies on wind and the powers that be, breeders prefer controlled conditions. Pollen is collected from the males at the optimum time and stored until ready for use. The pollen is applied to the female flowers as soon as they become receptive. The resulting seed is collected at the end of the season and stored until ready to germinate.

Year 2: Seed germination and seedling screening.
The seeds resulting from the crosses are germinated and established in the greenhouse. The greenhouse seedlings may be screened for diseases such as powdery mildew and downy mildew. The post-screening population will be planted in a field plot for additional screening such as segregation of males from the females.

Years 3-5: Single hill evaluation.
The seedlings are transferred to a single hill (one plant) nursery and evaluated for three years. Evaluation criteria at this stage include several agronomic and botanical factors such as yield, harvest date, growth habit, and cone morphology. Brewing value is also evaluated on the most promising selections. Analyses at this point may include alpha, beta, cohumulone, total oils, storage stability, and general aromatic characterization.

After three years of evaluation at this stage, selections are made based upon the objectives for the crosses and other traits of interest. The individuals selected at this stage will be propagated to multiple hills for further evaluation.

Years 6-8: Advanced plot evaluation.
The selections from the single hill will be evaluated in multiple hill plots for three more years. The number of hills is dependent on the individual breeding program, but is generally between five and 30 plants per selection. Often times these plots are replicated in multiple locations to determine how adaptable the selections are to varying environments.

The evaluation criteria are similar to the single hill stage, with the exception that the evaluation is based upon multiple hills so error rates are minimized. Additional analyses will include specific oils and the aromatic characterization of each selection. At this point there is generally enough material from harvest for samples to be distributed to brewers for sensory evaluations and possibly pilot scale brewing.

After three years of evaluation, another round of selection is made. The top-performing plants will be advanced to "Elite" status.

Years 9-11: Elite evaluation.
The selections in the elite plots are evaluated on a larger scale, generally one to five acres. The goal at this stage of the program is to confirm the performance of the selections both agronomically and in the brewhouse. Enough material is available for scaled-up brewing trials, usually by several brewers.

After three or more years of evaluation, the elite selections are evaluated for release and commercialization. After a decade of testing, the breeders' hope is to select one for commercialization. With an abysmal success rate of less than a hundredth of a percent, breeding would appear to be a discouraging if not depressing prospect, and it certainly can be. It should be considered, though, that between public and private efforts, there are at least four large and several smaller breeding efforts currently underway in the U.S. This means that in any given season, there are tens of thousands of potential new varieties vying for the next top spot. All things considered, the future looks incredibly bright for beer lovers.

Year 11 +: Commercialization

With a new variety fully tested and ready to go pro, it may seem like the breeder's work is done. In reality, though, it is just beginning. Full commercialization is dependent upon commercial acceptance, and in the case of aroma hops, this can take several years. Simcoe® and Citra® are recent examples. The cross that generated Simcoe® was made by Chuck Zimmermann in the late 80s, yet it did not gain widespread commercial acceptance until well into the 2000s. Citra® resulted from a cross made by Gene Probasco in 1990, yet was not commercially released until 2008. Times have changed since these hops were first selected, though, and the traditional barriers to commercialization are rapidly coming down.

Whereas in the 1980s and 1990s the craft industry was a small, quiet voice in the hop world, we now have an industry full of rapid technology adopters, hungry for innovative hops. The result is a quicker path to market than in the past, followed by rapid expansions in acreage.

From 2010 to 2011, Centennial acreage expanded by nearly 80 percent and Cascade by 22 percent. This is tremendous growth considering a shrinking world hop market. In comparison, Citra® and Simcoe® both grew by roughly 110 percent in this same time period. This illustrates just how rapidly demand is expanding for aroma hops, particularly the next generation hop varieties. Other unique varieties such as Ahtanum™ and Amarillo® from the U.S., and Galaxy and Nelson Sauvin from the southern hemisphere, are enjoying similar surges in popularity.

Our search for mild nuances of spicy, herbal, citrus, and earthy has now expanded to include pronounced aromas of tropical, citrus, stone, and pome fruits as well as berries, herbs, and spices. We are just now beginning to appreciate the potential. This range of aromas should excite not just hop heads, but lovers of all styles of beer as we continue to identify specific applications for hops. In this regard, the hop oils have now taken on as important a role in hop breeding as the alpha acids—revolutionary indeed.

Predicting where this trend will lead in the long term is tricky. It is safe to say that the possibilities are as numerous and as varied as the beers the hops will be used in. Experimental hops are increasingly finding their way into the glass of the consumer or the homebrew kettle. Much like our medieval predecessors, today's beer drinkers and small scale brewers are again playing a fundamental role in directing the evolution of the commercial hop.

Jason Perrault is a hop breeder and fourth-generation hop farmer based in the Yakima Valley of Washington state. He is currently the vice president of research and development for Select Botanicals Group, a member company of Hop Breeding Company. Additionally, his family owns and operates Perrault Farms, Inc. near Toppenish. Perrault Farms is a multi-generational company that specializes in conventional and organic hop production.

The New Rules of BREWING WATER

By John Palmer & Colin Kaminski

Editor's Note: The following is an excerpt from the book Water *by John Palmer and Colin Kaminski, to be published by Brewers Publications in 2013.*

For perhaps 200 years, the sum of conventional wisdom on water for brewing has been:

1. If the water tastes good, the beer will taste good.
2. Pre-boil the water to get rid of temporary hardness.
3. The alkalinity of the water should be less than 50 ppm.
4. There should be 50-100 ppm of calcium in the water.
5. Organic contaminants should be reduced or eliminated via filtering.

The problem with these rules is that they are constructed for primarily one style of beer and primarily as an ingredient. The rules do not address other styles of beer or the elephant standing in the corner—water as a manufacturing resource.

Brewing used to be small scale—local beer was made with local ingredients, and local rules evolved as the beer evolved into a regional style. Then the industrial revolution occurred and brewing became big business. Beer was analyzed, categorized, and normalized into the equivalent of white sandwich bread. The rules for brewing water were written in stone and brought down from the mountain. And for a few generations, people were satisfied. But then craft brewing came along and questioned the rules—one water could not brew all styles. And then new environmental regulations came along, and wastewater nearly had to be cleaner than the source water. So what are the new rules about brewing water?

The New Brewing Rules

1. One size does not fit all. Beer, in all of its styles, is the most complex beverage known to man.
2. Starch conversion in the mash works most efficiently at a mash pH of 5.1-5.5 at mash temperatures.
3. Calcium and magnesium hardness in the water react with malt phosphates to neutralize alkalinity. This reaction determines a quantity known as the residual alkalinity, which affects the mash pH.
4. In general, the darker malts used in darker beer styles are more acidic, and therefore to hit the target mash pH, the brewing water needs a correspondingly higher residual alkalinity to maintain the balance.
5. Assuming a consistent fermentation, the mash pH drives the kettle pH, and the kettle pH is a primary factor that determines the way the flavors of the beer are expressed to the palate.
6. The best water for brewing is probably not the best water for other uses in the brewery, such as cleaning, steam generation, chilling, etc.
7. "You can't dump that (wastewater) here."

There is a paradigm at work here: *One water for all brewery processes and for all beers*. The new paradigm needs to be: *The appropriate water for each beer, and the appropriate water for each brewery process*. To make the best beer and run the best brewery, we need to think of these needs separately and plan the right resources for each.

The first goal of this book is to educate the brewer on water as a beer ingredient beyond the crystal-clear mountain stream thing.

The single-paradigm view led to a reactionary approach to water use. What we hope to do with this book on brewing water is give you the tools to change the game—to be proactive, to take whatever it is you have and be able to build whatever you need. The first goal of this book is to educate the brewer on water as a beer ingredient beyond the crystal-clear mountain stream thing. The second is to identify and discuss all of the issues with water use and conservation in the brewery. Brewing beer should be all about making water work for you, not the other way around.

Overview of Water as Ingredient

Beer is more than just water, and conversely, brewing water is more than an ingredient in beer. Brewing is a very water-intensive activity, using anywhere from 5-15 volumes of water for each volume of beer. Most of this water is used for cleaning, some is lost to evaporation,

and most of it will end up going down the drain unless it is reclaimed. Let's look at all the uses of water in the brewery and then examine the requirements for each.

The first requirement for brewing water is that it be *clean*. The water may be fit to drink, but it may not be fit to brew with. Drinking water may contain chlorine, or chloramines, or a bit of hydrogen sulfide gas, or other organic molecules that will affect beer flavor down the road. The simplest method for ensuring clean water for brewing is by activated carbon filtration. No brewer has ever regretted carbon filtering the water before brewing with it.

In his seminal book, *On Food and Cooking*, author Harold McGee states that cooking is chemistry. And so is brewing. Beer may seem to be a simpler recipe than most, but the chemistry is every bit as complex. A brewer needs to think of water and water sources as you would when considering different bittering and aroma profiles in hops. Different water sources have different chemical profiles and therefore different benefits for various beer styles. Crystal pure mountain spring water is a great idea in theory, but the reality is the water probably needs more calcium for pH stability in the mash and better beer clarity, and some more sulfate to punch up the bitterness.

Some people speak of beer as liquid bread. In fact, it is more than bread—it takes longer to cook beer than it does to cook bread, and you use more ingredients. Perhaps it is closer to making soup. When you make soup, you start with clean potable water and then add various meats and vegetables to give it the characteristic flavors for the recipe. You boil it and then voilà, you have perfect soup, right? Wrong! What you have is a very bland mixture of water, meat, and vegetables that approaches your expectations but doesn't quite make it. What is missing? Seasoning! And this is precisely what is lacking from a great many beers brewed today. Sulfate, chloride, and other minerals can be added to the brewing water to enhance the flavor of the beer, just like salt is added to enhance the flavors in the soup. It really is strange that brewers rarely give any thought to seasoning their beer, when seasoning is used universally in other prepared foods.

Generally, brewing water for beer should have a minimum of 50-100 ppm of calcium, and 50-150 ppm total alkalinity for pale to brown beers. If your brewery focuses on darker styles, a total alkalinity of 200-300 ppm would not be inappropriate, but the taste of the beer must be your guide. The sulfate to chloride ratio in the water will drive the flavor of the beer to a large extent. A ratio of 1:2 of sulfate to chloride will accentuate the malt character of the beer, but lower ratios are not recommended, based on personal experience. Higher ratios of 4:1 and even 8:1 can create a firm, dry hop character, and prevent highly bitter beers from being cloying. In all cases, the total concentration of all minerals must be managed to produce the desired character without producing mineral water.

Cleaning

The largest water use aside from the beer is probably for cleaning. This is the one and only area where the colloquial terms "hard" and "soft" are actually useful. The term hard means that it is hard for soap to raise a lather. Water hardness describes the overall level of metal ions in the water, and these are mainly calcium and magnesium, which tend to form carbonate scale. Soft water means that soap lathers easily, and that the water is low in metal ions. Water softeners work to replace the scale-forming heavier metals with sodium or potassium, which are more soluble and do not form scale. The problem with softened water is that it becomes difficult to rinse detergents because the water is already full of sodium ions and won't take any more from the soap.

Therefore, cleaning water should not be too hard, to avoid leaving scale on plumbing fixtures and equipment, but should not be over-softened with a salt-based water softener, either.

John Palmer is the author of the book *How to Brew* and co-author of *Brewing Classic Styles*. Colin Kaminski is the brewmaster at Downtown Joe's Brewery & Restaurant in Napa, Calif.

by Amahl Turczyn Scheppach

18th Annual Boneyard Brew Off

"AG24 Oktoberfest"

OKTOBERFEST/MÄRZEN

Recipe by Dennis Decker, Pleasant Valley, N.Y.

INGREDIENTS

for 10 U.S. gallons (37.85 L)

12.0 lb (5.44 kg)	Munich malt
11.0 lb (4.99 kg)	German Pilsner malt
8.0 oz (227 g)	Caramel Munich malt
4.0 oz (113 g)	aromatic malt
4.0 oz (113 g)	biscuit malt
1.5 oz (42 g)	Tettnanger, 4.5% a.a. (60 min)
1.25 oz (35 g)	Hallertauer Mittelfrüh, 4.4% a.a. (60 min)
1 tsp	calcium chloride (in mash)
1 tsp	lactic acid (in mash)
1	Whirlfloc tablet (boil, 15 min)
1 tsp	Irish moss (boil, 10 min)
	Wyeast Labs No. 2206 Bavarian lager yeast (starter)
	2.4 vol forced CO_2 to carbonate

Boil Time: 60 min
Original Gravity: 1.059
Final Gravity: 1.015
ABV: 5.74
IBUs: 20.3
SRM: 10.4
Brewhouse Efficiency: 70%

DIRECTIONS

Use a two-step mash with a protein rest at 122° F (50° C) for 25 minutes, followed by a main rest at 152° F (67° C) for 90 minutes. Pitch yeast at 62° F (17° C), hold at that temperature for 24 hours, then drop to 50° F (10° C) and hold there for 20 days. When fermentation is complete, raise temperature to 65° F (18° C) for a two-day diacetyl rest, then drop to lagering temperatures for a month or more.

Extract Version: Substitute 7.9 lb (3.6 kg) liquid Munich malt extract for the Munich malt and 7.7 lb (3.5 kg) liquid Pilsner malt extract for the Pilsner malt. Steep the remaining grains in 158° F (70° C) water for 30 minutes, strain, add the malt extract, bring to a boil, and proceed with the recipe as written.

Photos courtesy of Dennis Decker and BUZZ

The 18th annual Boneyard Brew Off was held January 14, and sponsored by The Boneyard Union of Zymurgical Zealots (BUZZ) homebrew club. BUZZ was established in 1994 by University of Illinois at Urbana-Champaign graduate students and faculty, and has since expanded to include regional homebrew enthusiasts. According to competition organizer Marco Boscolo, the club currently has a mix of university and non-university affiliated members who have gone on to win the Midwest Homebrewer of the Year and Meadmaker of the Year multiple times, as well as the AHA Ninkasi award and the Samuel Adams Longshot Competition. They've gone on to open breweries, start new homebrew clubs, and become BJCP judges.

The name "Boneyard" refers to a creek running through sister cities Champaign and Urbana. The club's motto *Vivitas Non Exubant*, loosely translated as "no one gets out alive" is a reference to their 18-year-old Brew Off, as they hold an annual "No One Gets Out Alive" high-gravity portion of the yearly competition.

This year's Brew Off Best of Show winner, Dennis Decker, has been brewing for three years, and has launched himself into the hobby with the same commitment as he has for his other passion—riding dirt bikes. He hopes to be able to compete, as he does with his riding, on national and international levels, and his recent brewing accolades indicate he's well on his way toward this lofty goal. Not only did Decker take the Best of Show win at the Boneyard Brew-Off, he finished third for Best of Show at the Wizard of SAAZ competition with the same beer, on the same weekend.

LEFT: The Boneyard Brew Off is sponsored by the BUZZ homebrew club.

As with most homebrewers, what started out as a whim for Decker quickly grew into a full-blown obsession. "I started brewing about three years ago," he recalled. "I saw a 75-percent-off Mr. Beer kit at the local CVS Pharmacy and the rest is history." From there, he quickly moved to all-grain brewing, and his thirst for brewing knowledge led him to take the Siebel Concise Course online last spring. "That really helped me step up my game." He now brews on a two-tier, three-vessel, converted half-keg system with a March pump that he built in his garage. His best advice for brewing great beer starts with the basics. "I'd say paying close attention to sanitization and controlling fermentation temperature are what I have found to be the most important factors in making good beer."

Dennis Decker

Decker's top styles to brew follow his tastes. "I most enjoy brewing pale ales and IPA, since I enjoy drinking them the most. I also like to mix it up with seasonal beers like Oktoberfest. That would be my inspiration for brewing the beer that was BOS at the BUZZ contest."

With luck, Decker's brewing skills will soon be available to beer enthusiasts everywhere, as he plans to go pro. "I'm in the preliminary stages of starting a brewpub/micro (called Elsinore Brewing

AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

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

May 5
Greg Noonan Memorial Competition
South Burlington, VT. Entry Deadline: 4/20/2012.
www.mashers.org/comp_2012/comp_page1.html

May 5
Sasquatch Brewfest Homebrew Competition
Eugene, OR. Entry Deadline: 4/28/2012.
www.northwestlegendsfoundation.org/

May 5
Torneo Apertura 2012
Buenos Aires, AR. Entry Deadline: 5/3/2012.
www.somoscerveceros.com.ar

May 5
Spring Fling Brew Off
Bozeman, MT. Entry Deadline: 5/5/2012.
www.brewmontana.com

May 6
Battle of the Bubbles 2
Frederick, MD. Entry Deadline: 4/28/2012.
bob.brewcompetition.com

May 12
BrewFest at Mount Hope
Manheim, PA. Entry Deadline: 5/5/2012.
www.parenfaire.com/homebrew

May 12
The Grumpy Troll Challenge
Mount Horeb, WI. Entry Deadline: 5/6/2012.
www.thegrumpytroll.com/pdf/homebrew_challenge.pdf

May 12
Spirit of Free Beer Competition
Falls Church, VA. Entry Deadline: 5/4/2012.
brew.burp.org/

May 12
Meadllennium
Winter Springs, FL. Entry Deadline: 5/6/2012.
www.cfhb.org/meadlennium/

May 12
3rd Annual SCABS Homebrew Competition
Owosso, MI. Entry Deadline: 4/28/2012.
www.scabshomebrewclub.com

May 12
So You Think You Can Brew
Berkeley Heights, NJ. Entry Deadline: 4/28/2012.
www.njbeerfest.com

May 12
Goblets of Gold VI (Mead Only)
Homer, AK. Entry Deadline: 5/11/2012.

May 12
Hangar 24 Homebrew Competition
Redlands, CA. Entry Deadline: 5/5/2012.
www.hangar24brewery.com/homebrew.htm

May 12
2012 THIRSTY Classic
Amana, IA. Entry Deadline: 5/4/2012.
www.thirstyhomebrew.org

May 17
VanBrewers Homebrew Competition
Vancouver, BC. Entry Deadline: 5/11/2012.

May 18
The Hogtown Brew-Off
Gainesville, FL. Entry Deadline: 5/5/2012.
hogtownbrewers.org/Brewoff

May 18
Ska GABF Pro-Am Competition
Durango, CO. Entry Deadline: 5/4/2012.
www.durangohomebrew.com

May 19
18th Annual Eight Seconds of Froth
Cheyenne, WY. Entry Deadline: 5/12/2012.
www.bbriggs.vcn.com/8seconds.html

May 19
Oregon Homebrew Festival
Albany, OR. www.hotv.org/

May 19
Merrimack Valley Homebrew Competition
Lowell, MA. Entry Deadline: 5/5/2012.
www.mvhbc.com

May 19
16th Annual BEER Brew-Off
St. James, NY. Entry Deadline: 5/12/2012.
www.beerhbc.org/

AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

(continued from page 57)

May 19
Cajun Classic
Lake Charles, LA. Entry Deadline: 5/1/2012.
louisianabeerfest.com

May 19
US Open
Charlotte, NC. Entry Deadline: 5/10/2012.
www.carolinabrewmasters.com

May 19
2nd Annual Bricktowne Beerzilla MaiFest
Medford, OR. Entry Deadline: 5/12/2012.
www.bricktownebeer.com

May 19
LMHBA King of the Mountain
Willoughby, OH. Entry Deadline: 5/6/2012.
www.lmhba.com/kingofthemountain.htm

May 19
Upland Brewing Co. UpCup Competition
Bloomington, IN. Entry Deadline: 5/12/2012.
www.uplandbeer.com

May 19
OC Fair Homemade Beer Competition
Costa Mesa, CA. Entry Deadline: 5/4/2012.
www.ocfair.com/competitions

May 20
California State Fair 2012
Sacramento, CA. Entry Deadline: 5/2/2012.
www.bigfun.org

May 20
17 Annual Big Batch Brew Bash
Houston, TX. Entry Deadline: 5/11/2012.
www.thekgb.org

May 20
Southern Star 2012 Pro-Am Competition
Conroe, TX. Entry Deadline: 5/8/2012.

May 25
Great Alaska Craftbeer & Homebrew Festival
Haines, AK. Entry Deadline: 5/22/2012.
www.seakfair.org/beer-fest/

May 27
California Festival of Beers
San Luis Obispo, CA. Entry Deadline: 5/1/2012.
www.hospiceslo.org/beerfest/

June 2
Buzz Off
West Chester, PA. Entry Deadline: 5/19/2012.
www.buzzhomebrewclub.com/

June 2
MontreAlers Ale & Lager Throwdown
Montreal, QC. Entry Deadline: 5/5/2012.
montrealers.ca

June 3
Liquid Poetry Slam
Fort Collins, CO. Entry Deadline: 5/25/2012.
slam.liquidpoets.com/

June 7
VII Concurso Nacional das Acervas
Piracicaba, SP, Brazil. Entry Deadline: 6/1/2012.
www.acervapaulista.com.br/concursonacional2012

June 8
Battle of the Homebrews
Medford, OR. Entry Deadline: 6/1/2012.
www.battleofthebones.com

June 9
Upstate Brewers Cup
Greenville, SC. Entry Deadline: 6/6/2012.
Grapeandgrains.com

June 9
Blue Grass Cup
Lexington, KY. Entry Deadline: 5/25/2012. bock.beakerboy.com/

June 9
Alameda County Fair Homebrew Competition
Pleasanton, CA. Entry Deadline: 5/23/2012.
draughtboard.org/babo2012/htdocs/Announcement.htm

June 9
Second Annual Napa Homebrew Challenge
Napa, CA. Entry Deadline: 5/19/2012.
www.BungBrewers.com

June 9
Bethel Homebrew Festival & Brewers Challenge
Bethel, ME. Entry Deadline: 5/31/2012.

June 9
ABC Brews Crews Homebrew Competition
Ypsilanti, MI. Entry Deadline: 5/19/2012.
brewscrews.aabg.org/

June 16
San Mateo County Fair
San Mateo , CA. Entry Deadline: 5/9/2012
www.sanmateocountyfair.com/contests/departments/culinary-arts

June 23
Ohio Brew Week Homebrew Competition
Athens, OH. Entry Deadline: 6/8/2012.
www.ohiobrewweek.com/homebrew.html

Company) in the Hudson Valley region of New York state," he said. There is little doubt he'll find similar success in the craft brewing segment.

Amahl Turczyn Scheppach is the 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.

May 5
AHA Big Brew: A Celebration of National Homebrew Day

May 14-20
American Craft Beer Week

May 19
AHA Rally at Upland Brewing Co. Bloomington, IN

June 8-9
SAVOR: An American Craft Beer & Food Experience, Washington D.C.

June 21
AHA National Homebrew Competition Final Round, Seattle, WA

June 21-23
AHA National Homebrewers Conference, Seattle, WA

August 4
AHA Mead Day

October 11
Great American Beer Festival Pro-Am Competition, Denver, CO

October 11-13
Great American Beer Festival®, Denver, CO

November 3
AHA Learn To Homebrew Day

KUDOS—BEST OF SHOW

AHA/BJCP Sanctioned Competition Program

June 2011

New York State Fair Home Brew Competition, 181 entries—*Christopher Kaufman, Pittsford, NY.*

October 2011

Bayside Brewers Oktoberfest, 86 entries—*Geoff Daly, Melbourne, VIC, Australia.*

December 2011

Palmetto State Brewers Open, 398 entries—*Nick Netherland, Winston-Salem, NC.*

January 2012

Big Beers, Belgians & Barleywines Homebrew Competition, 273 entries—*Jim Denier, Littleton, CO.*

Wizard of SAAZ V, 438 entries—*Michael Malinowski, Massillon, OH.*

18th Annual Boneyard Brew-Off, 175 entries—*Dennis Decker, Pleasant Valley, NY.*

Great Alaska Beer & Barley Wine Festival, 70 entries—*Black Raven Brewing Company, Paso Robles, CA.*

Doug King Memorial Homebrew Competition, 121 entries—*Norman Jufer, Ontario, Canada.*

1st Annual WHO Brewship Brewoff Competition, 101 entries—*Larry Cook, Dodge City, KS.*

Master Championship of Amateur Brewing (MCAB) XIV Finals, 203 entries—*Peter Polczynski, Tulsa, OK.*

Upper Mississippi Mash-Out, 1,000 entries—*Peter Polczynski, Tulsa, OK.*

2012 Winter Brewing Competition, 454 entries—*Greg Irving, Strongsville, OH.*

Homebrew Alley 6, 642 entries—*Ben Maeso, Rochester, NY.*

February 2012

Wort Challenge 2012, 18 entries—*Duncan Britton, Calgary, AB.*

Winter Beer Dabbler 2012, 107 entries—*Nick Rondeau, Hastings, MN.*

14th Annual Domras Cup Mead Competition, 63 entries—*Jerald Jameson, Savannah, GA.*

GEBL IPA Bracket Challenge, 132 entries—*Jiri Zatloukal, Seattle, WA.*

2nd Annual Small Batch: Big Thirst, 11 entries—*Ross Halligan, San Francisco, CA.*

Cincy Winter Beerfest - American Ale Competition, 83 entries—*Greg Irving, Strongsville, OH.*

7th Annual Peterson AFB Homebrew Competition, 459 entries—*William Beeson, Denver, CO.*

Beerfest 2012, 197 entries—*Diti Hanoitis, Melbourne, VIC, Australia.*

Fur Rondy Homebrew Competition, 45 entries—*Ryan Fowler, Anchorage, AK.*

The Great Northern Brew-Ha-Ha!, 277 entries—*Gregory Pitner, Burlington, WI.*

Kansas City Bier Meisters 29th Annual Homebrew Competition, 485 entries—*Chris Bible, Knoxville, TN.*

AHA Club-Only Competition, Dark Lagers, 65 entries—*Mark Prior, Bob Purrenhage, Dave Houseman, Chester Springs, PA.*

SNAFU Winterfest 2012, 122 entries—*Bradley Bennett, Las Vegas, NV.*

Bluff City Brewers & Connoisseurs Homebrew Extravaganza, 288 entries—*Jake Meeks, Memphis, TN.*

CowTown Homebrew Roundup, 353 entries—*Greg Zeniuk, Edmonton, AB.*

SODZ British Beerfest, 201 entries—*Richard Sheppard, Columbus, OH.*

Reggale & Dredhop Homebrew Competition, 422 entries—*Ed Moore, Highlands Ranch, CO.*

BABBLE Leap Beer, 325 entries—*Scott Pointon, Crest Hill, IL.*

Sonoma Community Center's Beer-vana, 92 entries—*Francisco Kameko, San Francisco, CA.*

March 2012

America's Finest City Homebrew Competition, 553 entries—*Frank Mays, Temecula, CA.*

Belgian Beerfest, 43 entries—*James Rimmer, Yarraville, VIC, Australia.*

Slurp & Burp Open, 344 entries—*Jason Rowley, Portland, OR.*

COMMERCIAL CALIBRATION

One way beer judges check their palates is by using commercial "calibration beers"—classic versions of the style they represent. Zymurgy has assembled a panel of four judges who have attained the rank of Grand Master in the Beer Judge Certification Program. Each issue, they score two 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.

Two malt-forward beers were sent to our judges for this issue.

First up was the cleverly named Pandora's Bock, a traditional bock from Breckenridge Brewery in Denver. Brewed with two-row pale, Munich, and caramel malts, it is hopped with four different varieties including Strisselspalt, Columbus, Northern Brewer, and Hersbrucker. It checks in at 7.5 percent ABV.

Breckenridge Brewery has been brewing Pandora's Bock as its spring seasonal since the mid-1990s when its production brewery was on Blake Street in Denver. Brewmaster Todd Usry felt that bock beers weren't well represented in the craft beer scene at the time, and he set out to brew a traditional Bavarian bock.

The brewery held a contest for its regulars to name the beer. "Pandora's Bock was such a clever entry, there was no question it was the winner," said brewery spokesperson Terry Usry.

Pandora's Bock is just one of two lagers that Breckenridge brews (the other is Regal Pilsner). Production of it tripled in 2011 over 2010.

Next up was a heavy hitter, Brooklyn Monster Ale from Brooklyn Brewery in New York. Available November through February, Monster Ale is an English barleywine, brewed from three mashes of heirloom British malt and spiced with aromatic American hops—Willamette, Cascade, and Fuggle. After undergoing four months of aging, it checks in at 10.3 percent ABV and 52 IBUs.

Brooklyn recommends aging Monster Ale for "many years," as it becomes more complex over time. Pairing suggestions from the brewery include a variety of cheeses, ice cream, flourless cake, and crème brulee.

"Buy a case and let it age, trying a bottle every six months or so," recommends judge David Houseman.

ON THE WEB

Breckenridge Brewery
www.breckbrew.com

Brooklyn Brewery
www.brooklynbrewery.com

BJCP Style Guidelines
www.bjcp.org

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

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 II 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 V judge, principal author of the 2004 BJCP Style Guidelines and president of the BJCP board who lives in Beavercreek, Ohio.

Pandora's Bock—Breckenridge Brewery, Denver, Colo.
BJCP Category: 5B Traditional Bock

THE JUDGES' SCORES FOR PANDORA'S BOCK

Aroma: Moderate bready, toasty maltiness with caramel notes. No hop aroma—OK. Clean, crisp lager aroma with no fruity esters. No DMS. No diacetyl. Alcohol is not evident in aroma. (9/12)

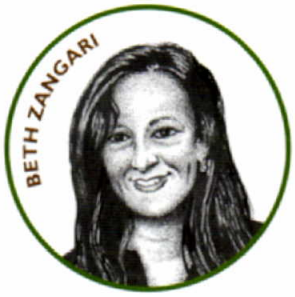
Appearance: Brilliantly clear with red-brown amber color and a dense, rocky, long-lasting, tan head. (3/3)

Flavor: Nutty, toasty, caramel malt with moderately high hop bitterness and low nutty, woody hop flavor. Maltiness is only moderately complex but quite tasty. Balance is toward malt but well supported by hops, with a dry, not sweet finish. Some lingering bitterness. Quite attenuated. No fermentation esters. No diacetyl. No DMS. Alcohol is not very apparent in the flavor. (16/20)

Mouthfeel: Medium body with thinner mouthfeel. Some lingering, light astringency. No alcohol warmth; the alcohol is there but very subtle. (3/5)

Overall Impression: A very drinkable beer. While balance is toward malt, the caramel and other malts, bitterness, and hop flavor result in a beer that is more similar to a big (imperial) California Common than a traditional bock. Additional malt, lower hop bitterness that leaves a bit sweeter and stronger, more complex malt presence, and higher perceived alcohol would make this an even better example of the traditional bock style. Still, this goes well with a soft pretzel, sausage, and cheese. (7/10)

Total Score: (38/50)



Aroma: Bready, rich, toasty malt with a hint of cinnamon spicy hop. Very clean fermentation character, with no diacetyl or fruitiness. (9/12)

Appearance: Deep copper with burnished highlights. Brilliant clarity. Light tan creamy foam persists. (3/3)

Flavor: Pronounced rich, toasty malt flavors with a hint of acidity; light bready malt sweetness is balanced with a firm hop bitterness; no hop flavor. Sweetness and malt are more pronounced mid-palate to the end, but the finish is clean, with a slight grainy note. Emphasis is on rich malt. (16/20)

Mouthfeel: Medium-full bodied and moderate carbonation. Low alcohol warmth comes forward toward the finish, and lingers with a clean, dry finish. No astringency. (5/5)

Overall Impression: Exemplifies light, clean richness without being heavy-handed. Maltiness has toasty, rich complexity with engaging sweetness that is confectionary, but not cloying. Yummy and satisfying, this could do damage to the uninitiated. Tasty and easy drinking. A very good example of style. (8/10)

Total Score: (41/50)

Aroma: Toasted malt up front, with underpinnings of graininess and caramel. Some melanoidins, but not as intense as German examples of this style. The alcohol aroma is medium-low and is accompanied by raisin notes. I pick up some cabbage notes from DMS. The aroma is interesting, but not as well-focused on the Munich malt as classic examples. (7/12)

Appearance: Copper color with ruby highlights. The clarity is brilliant, and there is just enough carbonation to form an off-white layer of foam on top of the beer. (3/3)

Flavor: Malt-forward from the initial sip, with caramel, toffee, and toasted breadcrumb components. The ester level is appropriately low for this lager style, but there are dark fruit (raisin and fig) notes from the malt. Initial vegetal notes from DMS fade as the beer warms. The caramel malt character is a little high. The malt profile is lacking in the complex melanoidins found in the traditional versions of this style. The hop bitterness is low to medium. (16/20)

Mouthfeel: Modest alcohol warmth. The carbonation level is moderately low, which works well for this malt-focused style. Residual sweetness lingers on the lips, but the body is on the light side for a bock. I pick up a touch of astringency just after swallowing, and this could be from using a little highly roasted malt. (3/5)

Overall Impression: A very good interpretation of the bock style. The malt is the focal point, as it should be, but the caramel and specialty malts do not quite mimic the intense, nutty, and complex melanoidins found in German examples of this style. If this were fermented with ale yeast, the recipe could easily be converted into a nice Winter Warmer. (6/10)

Total Score: (35/50)

Aroma: Moderately strong toasty, bready malt aroma with just a light sweetness. Light hops, a little spicy (unusual in a bock). Soft sulfur note (OK for a lager). Otherwise seems pretty clean. Light on the malt impact—especially the rich, malty, Munich-like notes. (9/12)

Appearance: Deep amber color—on the light side for the style. Very clear. Low beige head, settled quickly. (2/3)

Flavor: Toasty, biscuity malt flavor with a light malty richness evident toward the finish. Medium bitterness, becoming more apparent in the finish and aftertaste—a little too forward. Medium-low hop flavor—a bit much. Clean lager character; well-fermented. Dryish finish. Just a touch of alcohol flavor, accentuating bitterness and dryness. (14/20)

Mouthfeel: Medium-full body—nice. Moderately-high carbonation, bubbly—high for the style. Very lightly warming. Smooth. (4/5)

Overall Impression: The bitterness level and dryness tend to mask some of the maltiness. The flavors are nice, but the balance is a bit off—too hoppy/bitter. The malt richness only peeks out slightly; it could certainly use a more prominent Munich-like punch. I'm tasting more bready and biscuity flavors and less rich and toasty ones, as if specialty grains are adding complexity rather than traditional base grains. I like the attenuation, but reducing the hopping throughout would certainly improve the balance. Seems well made, but doesn't feature the malt as well as the best examples. (8/10)

Total Score: (37/50)

Illustrations by Terry McNerney

Monster Ale—Brooklyn Brewery, Brooklyn, N.Y.
BJCP Category: 19B English Barleywine

THE JUDGES' SCORES FOR MONSTER ALE

Aroma: Alcohol is the prominent aroma up front followed by caramel maltiness and hints of treacle/brown sugar. Low hop aroma evident as earthy tones in the background. No DMS. Some fruity esters as apricots and pears, but none of the dark pit fruits. No diacetyl. (9/12)

Appearance: Bright clarity. Orange-amber color a bit light. Thin, rocky, tan head with good retention. (3/3)

Flavor: Caramel malt with a light citrus note and lots of alcohol that is a bit hot for the underlying beer. Assertive hop bitterness balances malt sweetness. The entire beer finishes on the dry side with both lingering bitterness and sweetness on the front of the tongue and a citrus sharpness on the tongue. Moderate esters are reminiscent of apricots and pears. No DMS or diacetyl. (14/20)

Mouthfeel: Medium to medium-full body. Mouthfeel is thinner—medium—due in part to citrus notes, not the low-to-medium carbonation. Lots of alcohol warmth. No astringency, although there is lingering bitterness in the mouthfeel. Overall, seems a bit thinner than the classic chewiness of the style. (3/5)

Overall Impression: Alcohol dominates this English barleywine. This one may be a bit young so the alcohol may age out over time. Additional malt complexity, fewer citrus notes in favor of English earthy/woody hop profile, and less attenuation would place this more squarely in the English barleywine style and also give a chewiness to the body/mouthfeel. Since there's no oxidation as yet, this may age over a couple years, so buy a case and let it age, trying a bottle every six months or so. (6/10)

Total Score: (35/50)

Aroma: Bready and caramel malt, moderate peppery rose hop aroma; ripe plum fruitiness lies in the background. (10/12)

Appearance: Burnished copper with red and gold highlights. Very good clarity. Fine off-white foam forms a creamy layer that does not persist, but falls to a ring around the edge of the glass. (3/3)

Flavor: Pronounced toasty caramel malt backbone balanced with an assertive earthy hop flavor, followed by a malty sweetness that gives way to caramel and sun-warmed, tree-ripened plum fruitiness at low level, as in the aroma. Finishes with an underlying pleasant lingering hop bitterness. Clean, lightly fruity fermentation. Malt becomes more toffee- and treacle-like as the beer warms. (15/20)

Mouthfeel: Medium-full bodied with moderately prickly carbonation and creamy texture. Carbonation seems to amplify the alcohol warmth that lingers on the tongue, lips, and throat, but which is in no way hot—just comfortably warming. (4/5)

Overall Impression: Strong malt character is balanced with an assertive hop flavor and cozy alcohol warmth. Hop character is not distinctly English. Seems like the overall presentation would gain complexity with additional aging, adding some sherry and currant flavors for depth. Comes across as between American in its freshness and English in its malt and hop leanings. (7/10)

Total Score: (39/50)

Aroma: Intense malt aroma, with notes of toffee, caramel, and toasted breadcrumbs. Moderately high alcohol, mainly ethanol, but with soft floral and vanilla notes, as well as a slight solvent character, which could be from higher alcohols. Raisin and stone fruit (dates) elements add complexity and may evolve into more of a sherry character when the beer ages. Hops are understated. (9/12)

Appearance: Brilliant clarity and a creamy white head with stellar retention. Copper color with mahogany highlights speaks to the use of crystal malt in the recipe. (3/3)

Flavor: Solid malt backbone supports an array of complex flavors. The malt intensity is medium-high, with toasty, caramel, and toffee notes. Moderately strong dark fruit esters, complemented by molasses and raisin components. I also pick up some almond notes, but no sherry-like oxidation. Pineapple-citrus notes that are almost lemony, but I attribute these to esters rather than hops. The bitterness is modest with respect to the malt, which leaves the finish a little sweet. (17/20)

Mouthfeel: A perfect level of dextrins, and the carbonation is also at a level that enhances the mouthfeel without being prickly. The alcohol warmth is a little high. (3/5)

Overall Impression: An excellent example of the English barleywine style. This sample is a little young, with esters and alcohol at the forefront. These should mellow out with some aging, and the solvent notes should also abate. The malt character is the highlight of the beer—chewy, full-bodied, with complex toffee, caramel, and toasted notes. (8/10)

Total Score: (40/50)

Aroma: Perfumey alcohol and hops dominate the malt. Alcohol is strongest, and has a sharp edge to it. Medium-low fruity notes. Malt is in the background, bready and biscuity with a hint of caramel; not much richness or sweetness noted. The alcohol isn't the pleasantly aged type; it is fresh and attacks the senses. The hops are a bit floral. It seems very young for a beer this size. (8/12)

Appearance: Medium amber color—rather light. Frothy beige bubbles, settled quickly to nothing. Fairly clear. (2/3)

Flavor: Initial malty richness is smooth and tasty with bready and biscuity notes and some rich caramel sweetness—a classic English malt presentation, with very nice complexity accentuated by dark fruity esters. However, there is very little time to savor the malt flavor as the medium-high bitterness and hop flavor and strong alcohol attack the palate quickly. The finish is alcohol and bitterness with only an impression of malt. The aftertaste is dominated by the evaporative effects of alcohol. Not syrupy or cloying; this beer is well attenuated. Big and aggressive like a young Thomas Hardy's Ale used to be. (13/20)

Mouthfeel: Full body, rich but not syrupy. Warming, with a hot burn in the finish and aftertaste. Medium carbonation. Sharp alcohol bite ruins the otherwise brilliant palate experience. (3/5)

Overall Impression: Way too young. I'd cellar this at least another year, maybe more like three. The alcohol dominates all aspects of this beer. The initial malt taste is interesting, and has the right components; it definitely hints at good things to come. (6/10)

Total Score: (32/50)

by Charlie Papazian

Sweet Mischief

Bohemian Brewery's Viennese Lager

Last year my path intersected nicely with a wonderful four-percent Vienna-style lager brewed by the Bohemian Brewery in Salt Lake City. It's a sessionable beer with malt and hop characters coming together to create subtle complexity and thirst-quenching satisfaction. I wanted to homebrew something like this. But I've also had on my to-do list a desire to brew another English mild ale.

So you've heard this before: I relaxed and had a homebrew, and my next brew came together. I combined my ideas and techniques for a recipe that would satisfy my desire for a cloned Vienna lager and a favorite homebrewed mild ale.

Sweet Mischief Vienna-Mild

ALL-GRAIN RECIPE

INGREDIENTS

for 5.5 U.S. gallons (20.82 liters)

4.0 lb (1.82 kg)	10° L German Munich malt
2.0 lb (0.9 kg)	German Pilsner malt
1.5 lb (680 g)	20° L English Brown malt
6.0 oz (168 g)	10° L English crystal malt
4.0 oz (113 g)	Belgian aromatic malt
1.25 oz (35 g)	German Hallertauer whole hops 4.3% a.a./ 5.4 HBU/150 MBU (60 min)
1.5 oz (42 g)	Mt Hood whole hops 5.3% a.a./8 HBU/223 MBU (45 min)
0.5 oz (14 g)	Crystal pellet hops (dry hop)
0.25 tsp (1 g)	powdered Irish moss
	German or Bavarian type lager yeast. I used White Labs Cry Havoc
0.75 cup	(175 ml measure) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging

Target Original Gravity 1.040 (10° P)
Target Extraction Efficiency: 75%
Approximate Final Gravity: 1.010 (2.5° P)
IBUs: about 25
Approximate color: 14 SRM (28 EBC)
Alcohol: 3.9% by volume

DIRECTIONS

A step infusion mash is employed to mash the grains. Add 8 quarts (7.6 liters) of 140° F (60° C) water to the crushed grain, stir, stabilize, and hold the temperature at 132° F (53° C) for 30 minutes. Add 4 quarts (3.8 liters) 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 (13.5 liters) of 170° F (77° C) water. Collect about 5.5 gallons (21 liters) of runoff. Add 60-minute hops and bring to a full and vigorous boil.

The total boil time will be 60 minutes. When 45 minutes remain, add the 45-minute hops. When 10 minutes remain, add the Irish moss. 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 gallons (19 liters) with additional cold water if necessary. Aerate the wort very well.

Pitch the yeast when temperature of wort is about 70° F (21° C). Once visible signs of fermentation are evident, ferment at temperatures of about 55° F (12.5° C) for about one week or until fermentation shows signs of calm and stopping. Rack from your primary to a secondary and add the hop pellets for dry hopping. Lager the beer at temperatures between 35-45° F (1.5-7° C) for 3-6 weeks. Prime with sugar and bottle or keg when complete.

Sweet Mischief Vienna-Mild
MASH/EXTRACT RECIPE

INGREDIENTS
for 5.5 U.S. gallons (21 liters)

4.5 lb (2 kg)	amber malt extract syrup or 3.6 lb (1.6 kg) amber dried malt extract
1.5 lb (680 g)	20° L English Brown malt
4.0 oz (113 g)	10° L English crystal malt
4.0 oz (113 g)	Belgian aromatic malt
1.5 oz (42 g)	German Hallertauer whole hops, 4.3% a.a./5.4 HBU/150 MBU (60 min)
1.5 oz (42 g)	Mt Hood whole hops, 5.3% a.a./8 HBU/223 MBU (45 min)
0.5 oz (14 g)	Crystal pellet hops (dry hop)
0.25 tsp (1 g)	powdered Irish moss
	German or Bavarian type lager yeast. I used White Labs Cry Havoc
0.75 cup	(175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging

Target Original Gravity: 1.040 (10° P)
Target Extraction Efficiency: 75%
Approximate Final Gravity: 1.010 (2.5° P)
IBUs: about 25
Approximate color: 14 SRM (28 EBC)
Alcohol: 3.9% by volume

DIRECTIONS

Heat 2 quarts (2 liters) water to 172° F (77.5° C) and add crushed brown, crystal, and aromatic malts to the water. Stir well to distribute heat. Temperature should stabilize at about 155° F (68° C). Wrap a towel around the pot and set aside for about 45 minutes. Have a homebrew.

After 45 minutes, add heat to the mini-mash and raise the temperature to 167° F (75° C). Pass the liquid and grains into a strainer and rinse with 170° F (77° C) water. Discard the grains. Add more water to the sweet extract you have just produced, bringing the volume up to about 2.5 gallons (9.5 liters). Add malt extract and 60 minute hops and bring to a boil.

The total boil time will be 60 minutes. When 45 minutes remain, add the 45-minute hops. When 10 minutes remain add Irish moss. 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 5.5-gallon (21-liter) batch size. Aerate the wort very well.

Pitch the yeast when temperature of wort is about 70° F (21° C). Once visible signs of fermentation are evident, ferment at temperatures of about 55° F (12.5° C) for about one week or until fermentation shows signs of calm and stopping. Rack from your primary to a secondary and add the hop pellets for dry hopping. Lager the beer at temperatures between 35-45° F (1.5-7° C) for 3-6 weeks. Prime with sugar and bottle or keg when complete.

The unique roast character of brown malt and the caramel sweetness of crystal malt along with lower gravity represent mild ale-ness. The generous amount of mellow, toasty Munich malt along with neutral base Pilsner malt heads in the direction of a Vienna lager. Belgian aromatic malt always contributes a great goosing if rich malt aroma and flavor is desired. The small amount of Belgian aromatic malt is subtle and has kind of a catalytic effect, helping emphasize the Munich and crystal.

Dry hopping with Crystal hops imparts an aromatic character appropriate to both English ales and German lagers. I wanted to give this beer a lager-like emphasis in bitterness and flavor, so I used German Hallertauer in the long bittering boil and American Mt. Hood to contribute a honey and floral-like flavor, though with a 45-minute boil most of that character is minimized. The overall balance of this beer emphasized subtlety yet offers satisfaction in those thirsty and sessionable occasions.

This could become a regular brew on tap at my home pub. Let's cut the shuck and jive and get on with some Sweet Mischief.

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

Charlie with the crew at Bohemian Brewery.

Photos courtesy of Charlie Papazian

ADVERTISERS INDEX

By Ryan Farrell

Beer, Baseball, and the BJCP

"You're a beer judge?"
"Yes."
"So, you judge beer?"
"Yup."

This is roughly the conversation when I'm on a plane or at a wedding, or sometimes on a plane going to a wedding, and the topic of work comes up. The next part usually goes one of three ways:

1. "Dude, that's awesome!" I've even gotten a few high fives. Then I explain that's not really what I get paid for. I help handle the finances, HR, and write the occasional article. But, yes, I love my workplace.

2. "So, you just drink beer all day?" Short answer is no.

3. Occasionally, I will encounter a beer aficionado: the enlightened soul who has studied the craft and savors the intricacies. His favorite brewery is in Portland and he homebrews; he's still tweaking his IPA recipe. Or maybe she owns a nanobrewery in D.C. that produces barrel-aged sours—someone who knows that funk in beer can be a good thing.

Since passing the Beer Judge Certification Program exam, I enjoy these chance meetings. It's like watching a baseball game with a fan who notices the way a batter diagnoses a curveball and holds up rather than swinging over the top of it. Commit to understanding the nuance, and the satisfaction is endless.

Of course, you can go too far.

You're at a party, your date wanders off to greet some friends, and you're left making small talk with Joey Baseball. He readily admits that he's wearing his 2004 Red Sox

World Series Championship T-shirt as an undershirt. He named his dog David Ortiz. He proceeds to talk about Manny Ramirez's OPS in the 2004 ALCS and you're adrift in a sea of statistical acronyms delivered with *Rain Man* accuracy, definitely.

When it comes to beer fandom, I'm not that guy. (Baseball is another story.)

I still enjoy a cold-activated macrobrew at the ballpark. I will happily pay a buck fifty for whatever's on happy hour. I don't turn my nose up at a citrus-infused lager on a hot summer day. I haven't lost my taste for the cheap and accessible, like a well-respected movie critic who admits to enjoying Michael Bay's latest series of explosions.

Given the choice, of course, I prefer something more complex, more layered. I've learned a lot about beer, pairings, and brewing since I started at the Brewers Association in 2006. Before that, I had experience in the restaurant industry (you know a 20-something English major who doesn't?), but limited knowledge of craft beer, and even less of a palate for it.

The BJCP changed all that. Here at the BA, out of 40 or so staff, about a third of us are judges. I can't walk to the copy machine without bumping into a refined beer palate. My co-workers have offered plenty of knowledge, mentorship, and discarded beer.

So, what's next? Once I amass more judging experience, I'll be a BJCP Certified judge. I'll continue to share my passion with all the other Joe Six Packs out there who got stuck in the window seat or out in the right field bleachers. I hear they're serving some pretty good beer in baseball stadiums these days.

Ryan Farrell is the human resources/finance coordinator for the Brewers Association. When not balancing the books, he enjoys tilting the pen on all subjects craft beer.

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