Brew Your Own

JULY-AUGUST 2003, VOL.9, NO.4

THE HOW-TO HOMEBREW BEER MAGAZINE

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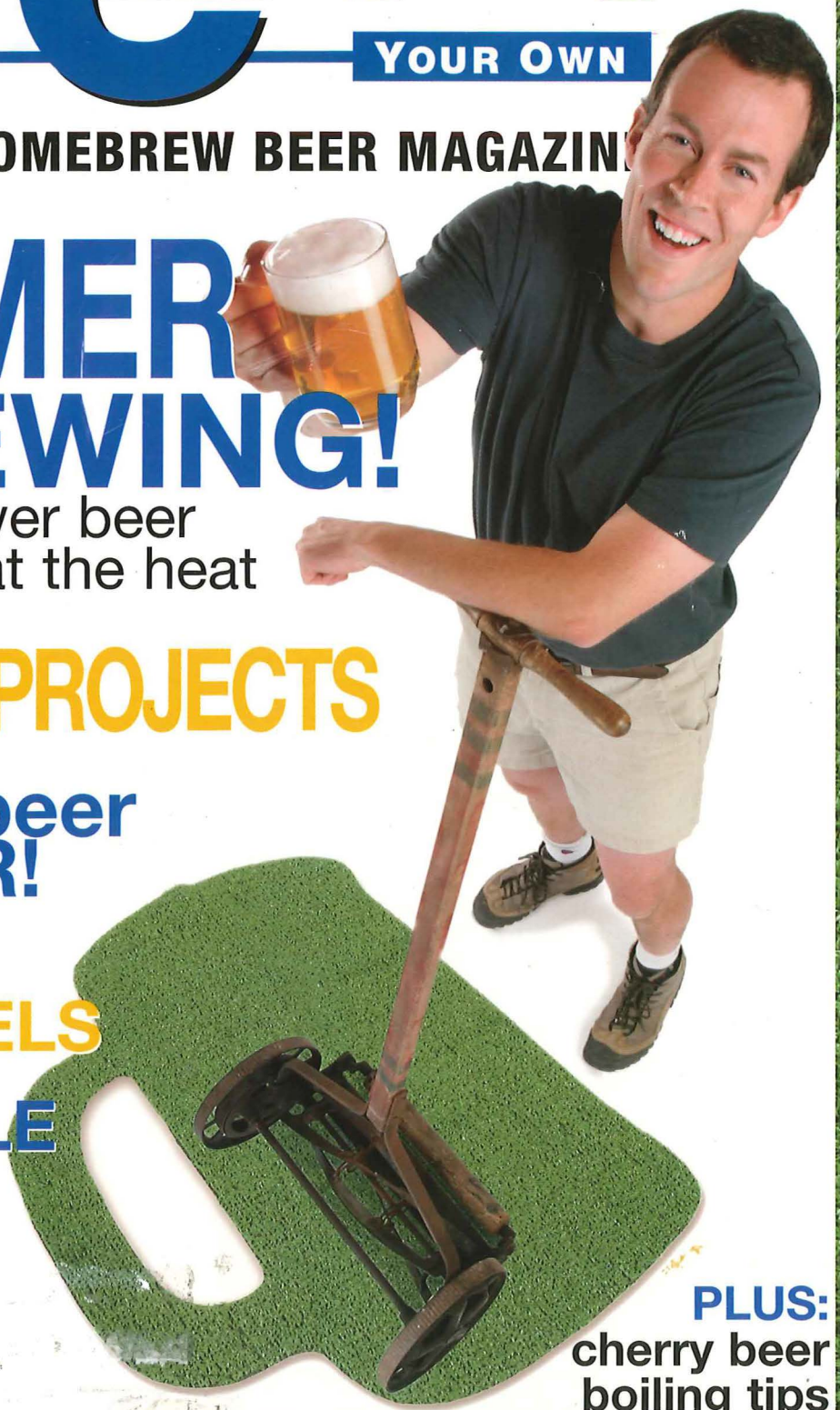

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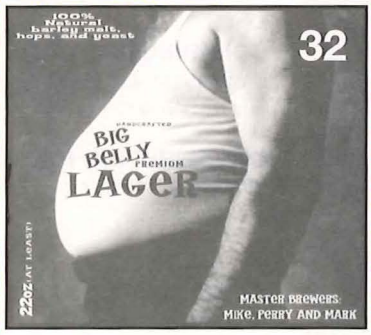

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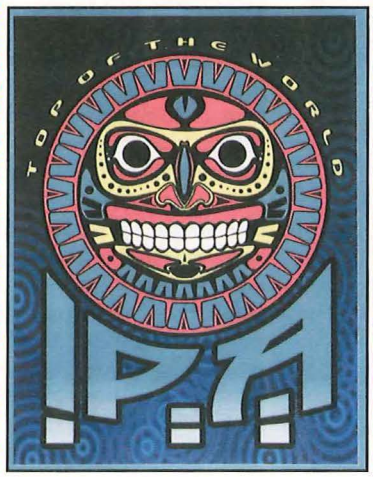

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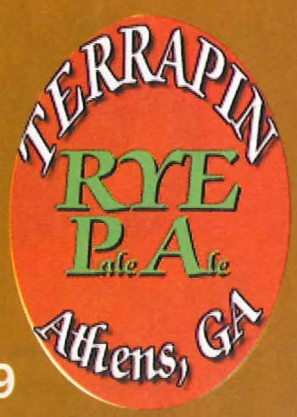

Brew Your Own

THE HOW-TO HOMEBREW BEER MAGAZINE

EDITOR
Kathleen James Ring

MANAGING EDITOR
Chris Colby

ART DIRECTOR
Coleen Jewett Heingartner

TECHNICAL EDITOR
Ashton Lewis

CONTRIBUTING WRITERS
Steve Bader, Thom Cannell, Chris Colby, Horst Dornbusch, Joe and Dennis Fisher, Colin Kaminski, Ashton Lewis, Thomas Miller, Steve Parkes, Tess and Mark Szamatulski

CONTRIBUTING ARTISTS
Don Martin, Ian Mackenzie, Shawn Turner, Jim Woodward

CONTRIBUTING PHOTOGRAPHER
Charles A. Parker

PUBLISHER
Brad Ring

ASSOCIATE PUBLISHER & ADVERTISING DIRECTOR
Kiev Rattee

ADVERTISING MANAGER
Michael Pollio

NEWSSTAND DIRECTOR
Carl Kopf

EDITORIAL REVIEW BOARD
Matt Cole • Rocky River (Ohio) Brewing Co.
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Chris White • White Labs
Anne Whyte • Vermont Homebrew Supply

How to reach us

Editorial and Advertising Office
Brew Your Own
5053 Main Street, Suite A
Manchester Center, VT 05255

Tel: (802) 362-3981
Fax: (802) 362-2377
E-Mail: BYO@byo.com

Advertising Contact
Kiev Rattee
kiev@byo.com

Editorial Contact
Kathleen James Ring
kath@byo.com

Subscriptions Only
Brew Your Own
P.O. Box 469121
Escondido, CA 92046

Tel: (800) 900-7594
M-F 8:30-5:00 PST
E-mail: byo@pcspublink.com
Fax: (760) 738-4805

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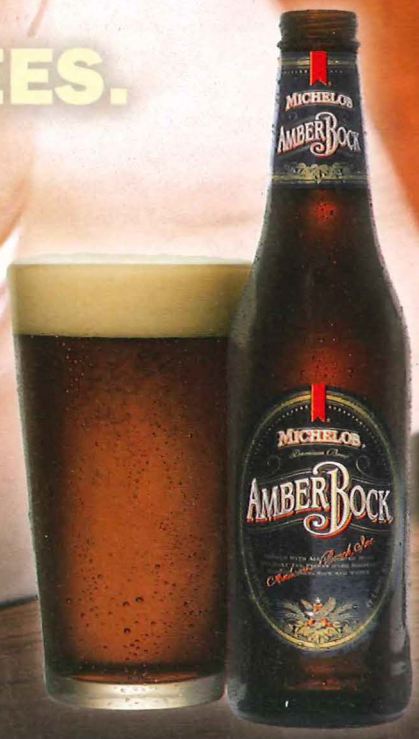
THE EYES LOVE IT.

THE MOUTH AGREES.



We're talking total agreement of the senses here. Which shouldn't be surprising, given AmberBock's rich, full flavored taste and unexpected smoothness. Isn't it time for a serious beer that tastes as good as it looks? ***Rich in color. Smooth in taste.***

©2002 Anheuser-Busch, Inc., Michelob® AmberBock Dark Lager (Dark Ale in TX), St. Louis, MO

Delicious . . . or Deadly?

Nice article on sweetgrass ale ("Sweetgrass Ale," May-June 2003 BYO), but doesn't that stuff kill cows dead?

Steve Nelson
St. Paul, Minnesota

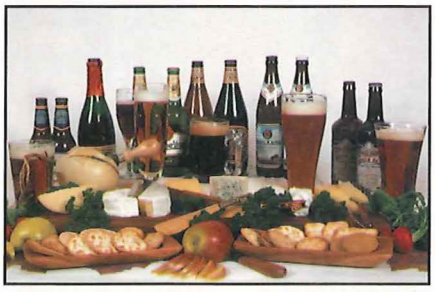
You are probably thinking of sweet clover. According to the Merck Veterinary Manual, sweet clover poisoning is a hemorrhagic disease that "occurs in animals that consume toxic quantities of spoiled sweet clover (Melilotus officinalis and M. alba) hay or silage. [. . .] During the process of spoiling, the harmless natural coumarins in sweet clover are converted to toxic dicumarol. [. . .] Dicumarol levels of 20–30 mg/kg of hay are usually required to cause poisoning in cattle. [. . .] This is based on a history of continuous consumption of sweet clover hay or silage over relatively long periods."

So, unless someone is making Spoiled Silage Lager and drinking liters of it every day, I don't think this would be a practical problem. Anyone worried about the possibility of misidentifying plants in the wild can order sweetgrass from the addresses given in the article's sidebar. No cattle were killed in the making of the May-June issue.

Limburger Lover

I really enjoyed the article about matching cheese with beer ("Beer and Cheese," May-June 2003). However, I was disappointed to see that limburger was not included. As a lover of the stinky cheese, I would like to see an article explaining the history of the cheese and its various uses, including what beer goes with it and how to eat it. If I remember right, this cheese was very popular with the Germans and matched well with dark beers, such as porter.

Burdette Coberley
via email



Author Tess Szamatulski responds: "Limburger is in line with the Belgian washed rind cheeses, as they are very aromatic (in other words, stinky). A Belgian strong golden or strong dark ale would be a good match for limburger. A German rauchbier would be equally nice. You need a strong beer to stand up to a strong cheese!"

For Extinguishing Thirst

I would like to know if it is possible and safe to convert an old copper fire extinguisher to a keg. I do not know how hard it will be, if it's even possible, to clean the inside for this purpose. My thought was to incorporate the tap into the screw-off top and add the CO_2 where the hose is attached.

Paul Michell
Raleigh, North Carolina

Projects author Thom Cannell responds: "The FDA does not permit copper for the preparation of acidic foods. Beer is acidic and copper has a metallic flavor that can be transferred to beer. Brew kettles, however, were grandfathered into this regulation and are still acceptable for use in wort production.

"As for storage, beer should not be kept in copper for 'lengthy' times. What that means is open to interpretation. I'd say kegging is lengthy, at least at my house. For a weekend or party? That's fairly short term, IMHO.

"I'd try to find some way to have the interior nickel-plated or powder-coated after I'd modified the keg in a manner similar to what you've suggested. I'd also get the vessel hydro-tested to ensure it won't rupture under pressure.

"Also, why not use the existing 'out' with an internal soft tube of some sort as the beer pickup, and then add the 'gas-in' at the top or behind?

"Not having seen the interior, I'd guess this oldie requires that you invert the tank, whereupon something inside ruptures and adds an acid to a bicarbonate-rich water solution to create dispensing pressure. It should have a good gasket already and the brazed-in hose fitting might be threaded internally. In that case you could adapt a compression fitting. Drilling the crown for a scavenged ball-lock fitting might be easy, or you might have to weld or braze the fitting to the crown. Alternately, you could adapt a high-quality, chrome-plated tire valve! Just my ideas."

Chemical Correction

The alternate name for 3-methyl-2-butene-1 thiol — the molecule that is responsible for skunkiness in beer — was incorrectly given as isopentyl mercaptan. It should have been isopentenyl mercaptan. This molecule is similar to the butyl mercaptans that skunks and their relatives produce. No mustelids were harmed in the making of the May-June issue.

Pellets or Whole Hops

I would like to use one of Horst Dornbusch's recipes for Irish Red Ale from the January-February 2003 edition of *Brew Your Own*, but I am unsure if his recipes use hop pellets or hop flowers.

Paul Di Prima
Brisbane, Australia

All recipes in BYO use pellet hops unless otherwise specified. Some hops, quite a bit actually, more than we'd care to admit really, were harmed in the making of the May-June issue. We boiled them . . . and we'll do it again. ■

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DARK ABBEY type for 9 1.
Starting specific gravity : 1.070 Alcohol content : 8 %.
One of the most well known Belgian specialties : an Abbey style beer with vinous character due to its high alcohol content. Deep amber, full flavoured with lots of malt aroma with caramel notes. Improves with long maturation times and can be kept for several years !

AMBIORIX type for 15 I.
Starting specific gravity : 1. 060 Alcohol content : 6,5 %.
Amber beer with a red copper tint. Slightly acidic palate at first but with a nice fruity aroma. Moderate hop bitterness. Comparable with the well known beer of Roeselare.

DIABOLO type for 9 1.
Starting specific gravity : 1.071 Alcohol content : 8 %.
Belgian specialty beer : Strong, golden coloured beer with a thick and long lasting head (lacy). Characteristic aroma of devil type Belgian beers, soft palate with a slightly sweet aftertaste. Improves with long maturation times and can be kept for several years !

KRIEK type for 12 1.
Starting specific gravity : 1.053 Alcohol content : 5,5 %.
Kriek is the best known of the famous Belgian fruit-beers, made by macerating cherries in beer. A slightly acidic, sweet aromatic beer with a red topper tint. Each kit contains pure cherry juice of at least 3 kg of cherries ! This beer gives you the perfect balance of fruitiness without tasting like grenadine as some commercial kriek's do.

OLD FLEMISH BROWN type for 12 1.
Starting specific gravity : 1.060 Alcohol content : 6 %.
A dark brown beer with a woody notes flavor a slight liquorice aftertaste that also compares with the Dutch Bock-beers.

CHRISTMAS type for 7 1.
Starting specific gravity : 1.065 Alcohol content : 8%.
Dark, strong and full-bodied Belgian beer, sweeter than Abbey style beers. Strong malt flavour and aroma. Improves with long maturation times and can be kept for several years !

WHEATBEER type for 9 1.
Starting specific gravity : 1.053 Alcohol content : 5%.
Very similar to the well known Belgian "Witbieren" : pale, opaline colour with low alcohol content. A real summer beer with a pleasant aroma, mild hops and a smooth malt character. Slightly acidic and thirstquenching. Based on an old recipe using barley, wheat, oat flakes and a secret herb mixture with coriander and sweet orange-peel.

GRAND CRU type for 9 1.
Starting specific gravity : 1.075 Alcohol content : 8%.
Gold opaline coloured, with strong flavour of grains and even bread. Very little hop aroma. Very mouthfull with light fruit notes and a pleasant sweetness. Also this kit contains wheat malt and a special herb mixture.

TRIPLE type for 9 1.
Starting specific gravity : 1.075 Alcohol content : 8%.
Triple is a well known, deep golden coloured, Belgian specialty. Due to its high malt contents it has a very pleasant aroma and taste, mouthfull, full bodied and even a bit herbaceous. High alcohol content.

FRAMBOOS type for 12 1.
Starting specific gravity : 1.053 Alcohol content : 5,5%.
FRAMBOISE or raspberry beer, is a Belgian specialty. Together with the BREWFERM KRIEK, this FRAMBOISE is the only fruitbeer kit available in the world. Each kit has an equivalent of 2 kilo of raspberries. This FRAMBOISE beer han a very delicate aroma and is ideal as a refreshing summer-beer or as a surprising aperitif !

PILSNER type for 15 1.
Starting specific gravity : 1.042 Alcohol content : 4,6 %.
Light, blond beer, with a moderate bitterness and dry finish, comparable with the commercial Lager or Pilsner beers. Low alcohol content.

GOLD type for 12 1.
Starting specific gravity : 1.053 Alcohol content : 5,5 %.
A real deluxe pilsner type with more malt flavor than the normal Lagers. Moderate hop bitterness. Comparable with the Scandinavian deluxe-Beers.

GALLIA type for 12 1.
Starting specific gravity : 1.055, Alcohol content : 5,5 %.
The latest addition in our range: A thirstquenching pale amber beer with a refined bitterness and a soft finish, a worthy alternative to the commercial Belgian ales.

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- Steam-Style Beer
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brewer PROFILE

Extract Ale from the Islands • By Bob Sterner

PHOTO BY BOB STERNER

Brewmaster Nelson Dilbert quenches a Caribbean thirst with his Old Dutch Ale.

Idyllic Grand Cayman seems an odd site for a battle of biblical proportions, but that's what's happening there as two brewers vie to win the hearts and palates of island residents and tourists.

"Goliath" in this battle is Stingray Brewing, which produces 80,000 gallons of all-grain ales and lagers each year. "David" is Big Daddy's Old Dutch Brewery, which produces 40,000 gallons of extract beer annually. Liquid malt syrups are the base for the brewery's signature Old Dutch Ale and, combined with adjunct grains, extracts also lay the foundation for the eclectic collection of additional ales it produces each year.

So who's winning the battle? "Stingray's is okay, but it's for the tourists," a local dive master told me. "All the locals drink Big Daddy's."

An assortment of fresh ales was on tap the day I stopped at Mezza, a cozy pub above the brewery. Tap handles for Big Daddy's Black Coral Ale, Belgian Wit and Old Dutch were lined up next to international brands at the bar. Six-packs of Old Dutch and Old Dutch Light are stocked downstairs in the carryout, the original of four package stores the Cleveland Dilbert family runs on Grand Cayman. Brewmaster Nelson Dilbert, Cleveland's 23-year-old son, was running the carryout when I dropped by. He talked animatedly about his brewery as he checked out a flurry of customers.

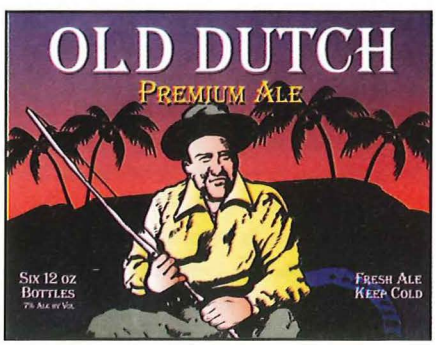
"When I was in college in Florida, my favorite place was a microbrewery called Hops," he said. "My father came up to visit. We went to Hops, and he said: 'This is a great idea!' I gave it some thought, and I told him I could give it a try."

With virtually no knowledge of brewing, Nelson delved into books, asked questions at brewpubs and shopped for gear. He settled on a system from California's Cross Distributing Company. While his 250-gallon stainless conical fermenters, kettle and hot tank were being shipped to Cayman, Cross set Nelson up as an apprentice at Lengthwise Brewing to give him some hands-on experience.

"When we started out, we had some pretty rough beers," he recalls of his December 1999 opening. "So we'd change a little of this and a little of that, and finally we came up with a beer that everyone seemed to like. We named it Old Dutch, after my grandfather."

Old Dutch Ale has an amber, somewhat coppery color. A slight haziness and mild clove-like taste are clues to the wheat malt in the recipe: Nelson uses a 50-50 mix of Alexander's pale and wheat extracts. He ferments with White Lab's California Ale Yeast (WLP001).

Nelson said he'd like to have beer lovers beyond Cayman taste his signature Old Dutch Ale, but shipping the brew is nearly impossible. So as one overgrown homebrewer to another, he's agreed to share his recipe with *BYO*.



cayman RECIPE

OLD DUTCH ALE

(5 gallons / 19 liters, extract)
OG = 1.048 FG = 1.012
IBU = 56 ABV = 4.7%

Ingredients

5 gallons water
3.3 lbs. (1.5 kg) Alexander's Sun Country Pale Malt Extract
3.3 lbs. (1.5 kg) Alexander's Sun Country Wheat Malt Extract
13.75 AAU Willamette hops pellets (bittering) (2.5 oz. / 71 g @ 5.5% alpha acid)
4 AAU Tettnanger hops pellets (flavor) (1 oz./28 g @ 4% alpha acid)
White Labs California Ale Yeast (WLP001)
3/4 cup corn sugar for priming

Step by Step

Dissolve malt extract into water, bring to a boil, then add Willamette hops pellets. Maintain boil for one hour, adding the Tettnanger hops during the last 10 minutes for aroma. Cool quickly to 68 °F (20 °C), then pitch yeast. Once heavy fermentation subsides in two to three days, remove the trub from the bottom of the conical fermenter or transfer the batch to a clean secondary fermenter. When secondary fermentation is complete at the end of the second week, cool the batch to 38 °F (3 °C) for a day to settle the yeast. Transfer the brew to a keg, force carbonate it and chill. Or transfer the contents of the secondary fermenter into a bottling bucket, prime with the corn sugar, then bottle. Store bottles at room temperature for a week or two, chill and enjoy.

BEER basics

YEAST STARTERS

A yeast starter is a small batch of beer used to raise yeast for your main batch of beer. Making a starter ensures that you have enough yeast to quickly and efficiently ferment your wort. It also ensures that the yeast you pitch are active and healthy.

Making a yeast starter is simple. For an average-strength ale, boil 0.5 lb. (0.22 kg) of light dried malt extract in 64 oz. (1.9 L) of water for 15 minutes. Cool this starter wort and transfer it to a sanitized bottle to which you attach a fermentation lock. (Brewpub growlers work well. So do 3L soda bottles.) For a lager, you should have a starter volume of one gallon (3.8 L).

You can pitch the entire starter or just the yeast sediment to your main wort. If you plan to pitch the whole starter, pitch the yeast to your starter wort one to two days before brewing. If you are going to pitch the sediment, pitch the yeast to your starter wort three to five days before brewing.

Ferment your starter wort at room temperature. Keep the fermentation lock affixed and shield the starter from light. Making a starter will take some extra time on your part, but will improve the quality of your beer greatly.

Send us your story!

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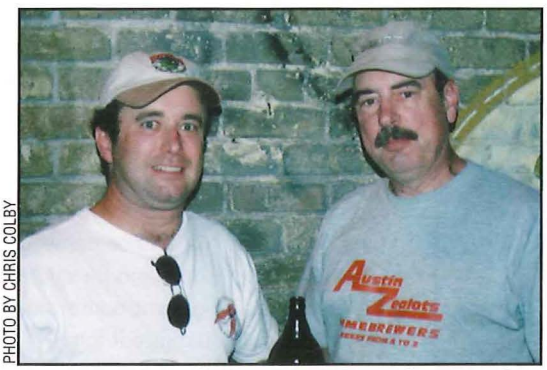


PHOTO BY CHRIS COLBY

Corey Martin and Marc Martin are the Secondary and Primary Fermenters of the Austin ZEALOTS.

The dictionary defines "zealot" as a fanatic. To our Austin homebrew club, "ZEALOTS" means . . . well, we're not quite sure. "Zymurgic Enthusiasts of Austin Loosely Organized Through Suds" is our current guess. But,the original acronym is lost to Austin's laidback history. Zombies Excited About Lechers On Texas Soil? Zookeepers Expressing A Love Of Tarts, Strumpets? It could have been anything.

"Loosely organized" certainly describes our club today. ("Organization? We don't need no stinking organization!") Much of the history of the ZEALOTS is shrouded in mystery (or perhaps drowned in beer). The club is rumored to have begun in the late 80s or early 90s. It almost faded into obscurity but Steve Williams, a brewer for the now-defunct Celis Brewing, took the helm and brought it back to life.

Today our club officers are our Primary Fermenter Marc Martin and our Secondary Fermenter Corey Martin (no relation). Marc sends out the monthly e-mail newsletter (Primary Fermentations) and conducts our meetings. Corey sends out weekly emails alerting the ZEALOTS to the location of our roaming happy hour, which is held every week at a different Austin brewpub. Corey also hosts the annual Christmas party at his house. At the last meeting, Dan Brzoska was appointed our IPA or Information Person Anonymous.

This year, several ZEALOTS did well in the first round of the AHA National Homebrew Contest. Keith Bradley won a 3rd place ribbon for his Oktoberfest-Märzen. Joe Walton won a 3rd place ribbon for his old ale. Dan and Joelle Dewberry scored a first place ribbon for their tripel and Corey Martin landed five ribbons — a second for his smoked porter and four firsts for his oatmeal stout, weizenbock, witbier and raspberry lambic. Overall, the ZEALOTS were the second-place club in the southern division of AHA Nationals.

Regular ZEALOTS meetings are held the third Saturday of every month at 6:30 PM. We meet at the Gingerman's bar, a great tap house, on 4th Street. We have about 65 members and about 30-40 show up at each meeting. At the meetings we focus on tasting the homebrews of our members. We have a style of the month and these beers are passed around first, followed by other homebrews. We've tasted a lot of interesting beers lately. At the last meeting we even had an oyster stout, made with real oysters. Mmmm . . . oysters. Once the beers have been tasted, we vote for our favorites. The most well-received beers get the "trash and trinkets" award — usually beer-related stuff such as posters, mugs, caps and the like.

If you live in the Austin area and are fanatical about beer, get more information on the ZEALOTS by contacting our IPA Dan Brzoska at dan@brzoska.com or Marc at mjmartin@texas.net or Corey at boozer@sbcglobal.net.

replicator TERRAPIN RYE PALE ALE

by **Steve Bader**

Last summer I discovered Terrapin Brewing Company's Terrapin Rye Pale Ale. I can't get enough of this awesome beer! They are based in Athens, Georgia and distribute only on draft in the Athens-Atlanta area. I must have good taste, because Terrapin Rye won gold at the Great American Beer Festival last fall.

Rick Fifer
Orange Park, Florida

The Terrapin Beer slogan is "extreme beers for extreme tastes" and this beer certainly fits the motto. Brewmaster Brian Buckowski calls Rye Pale Ale a complex beer that fulfills his desire for "brewing in 3D," which means a beer that challenges all of the senses. Rye Pale Ale has an upfront citrus and floral bitterness, with a malty middle and a slight sweetness from the honey malt. Rye malt gives it a clean, dry aftertaste.

As an "extreme" beer, Rye Pale Ale has a relatively high level of hop bitterness at 45 IBUs. The use of Magnum as the primary boiling hop helps keep the hop flavor from being harsh, since Magnum has a low cohumulone value. Brian also adds hops in five more additions throughout the brewing process. For yeast flavor, Brian suggests you use a yeast that is slightly fruity and complex. Then be patient and let the beer age for four weeks.

For more information, go to www.terrapinbeer.com or call (888) 557-BEER.

Terrapin Rye Pale Ale

(5 gallons / 19 L, extract with grains)

OG = 1.054 FG = 1.013 IBU = 45
Alcohol 5.2% by volume

Ingredients

3.3 lbs. (1.5 kg) Briess light malt extract syrup
2.33 lbs. (1.1 kg) Briess light dry malt extract
1 lb. (0.45 kg) rye malt
1 lb. (0.45 kg) Munich malt (10 °L)
0.5 lb. (0.22 kg) Victory malt (30 °L)
6 oz. (170 g) Gambrinus honey malt
14 AAU Magnum hops (bittering) (1.0 oz./28 g of 14% alpha acid)
3.75 AAU Fuggle hops (bittering) (0.75 oz./21 g of 5% alpha acid)
2.38 AAU East Kent Golding hops (flavor) (0.5 oz./14 g of 4.75% alpha acid)
2.38 AAU East Kent Golding hops (flavor) (0.5 oz./14 g of 4.75% alpha acid)
6.8 AAU Cascade hops (aroma) (1.0 oz./28 g of 6.8% alpha acid)
16.4 AAU Amarillo leaf hops (dry hop) (2.0 oz./56 g of 8.2% alpha acid)
1 tsp. Irish moss
White Labs WLP051 (California Ale V) or Wyeast 1332 (Northwest Ale) yeast
0.75 cup of corn sugar (for priming)

Step by step

Steep crushed grains in 1 gal. (3.8 L) of water at 155 °F (68 °C) for 30 min. Remove grains. Add 2 gal. (7.6 L) of water, malt extracts and bring these 3 gallons (11 L) of wort to a boil. Add Magnum, Irish moss and boil for 60 min. Add Fuggle for final 30 min. Add first East Kent Goldings for last 20 min. Add second East Kent Goldings for last 10 min. Add Cascade for last 3 min.

When you are done boiling, add the wort to 2 gal. (7.6 L) of cool water in a sanitary fermenter and top off with cool water to 5.5 gal. (21 L). Cool to 80 °F (27 °C), aerate and pitch your yeast. Allow beer to cool over the next few hours to 68-70 °F (20-21 °C), and hold at this temp until the yeast has fermented completely. Add the Amarillo hops when the beer is done fermenting. Remove the dry hops after about 4 days. Bottle your beer, age for two to three weeks and enjoy!

homebrew calendar

July 11-25
New York State Fair
Syracuse, New York
The New York State Fair 4th Annual Homebrew Competition is open to all New York state residents and sponsored by the Salt City Brew Club. Entry dates: 7/11 – 7/25. Fee: $8 for first entry, $5 additional. Contact Peter Garofalo at pgarofa1@twcny.rr.com or go to www.nysfair.org.

July 12
E.T. Barnette Competition
Fox, Alaska
The E.T. Barnette Homebrew Competition is sponsored by the Zymurgists Borealis homebrew club. Best of Show prize is $500! Six categories: Dark Ale, Light Ale, Dark Lager, Light Lager, Specialty/Mixed and Mead. Entry dates: 6/23 – 7/10. Entry fee: $5. Contact Scott Stihler at stihlerunits@mosquitonet.com or check out www.mosquitonet.com/~stihlerunits/ScottsDen/Beer/Events/Events.html

July 12-19
9th Annual Commander SAAZ Interplanetary Homebrew Blastoff!
Melbourne, Florida
The 9th annual Commander SAAZ Interplanetary Homebrew Blastoff will accept beers in all 28 BJCP categories. Entry fee: $6. Three bottles required for each entry. Entry forms at www.saaz.org. Contact Steve Mitchell at samitchell@cfl.rr.com.

July 19
Ohio State Fair
Columbus, Ohio
The Ohio State Fair Homebrew Competition is sponsored by SODZ and is open to all Ohio homebrewers. Entry dates: 7/14 – 7/18. Entry fee: $5. Contact Brett Chance at (b.chance@expo.state.oh.us or go to www.ohiostatefair.com.

July 20 – August 2
Mountain Brewer Open
Huntington, West Virginia
Sponsored by the Greater Huntington Homebrewers Association and the Huntington Museum of Arts. All BJCP styles, meads and ciders will be judged. Entry dates: 7/20 – 8/2. Entry fee: $5. Contact Dave Zalewski at djzalewski@mapllc.com or see the Website at www.hbd.org/ghha/.

homebrew SYSTEMS that make you DROOL

a very cool walk-in cooler • Ken Thornton • Wichita Falls, Texas

Ken Thornton mans the taps on the door to his walk-in cooler.

The center of the homebrew universe lies on an 18-acre farm near Wichita Falls, Texas. (Hyperbole? Nah.) Anyway, that's where homebrewer Ken Thornton lives. It's also where he runs the Wichita Homebrew Supply Shop. A metal warehouse across the drive from the shop serves as headquarters for WORTS (Wichita's Only Real Tasty Suds), the local homebrew club. The warehouse is also home to Ken's brewing equipment and his walk-in beer cooler. And the cooler is very cool indeed.

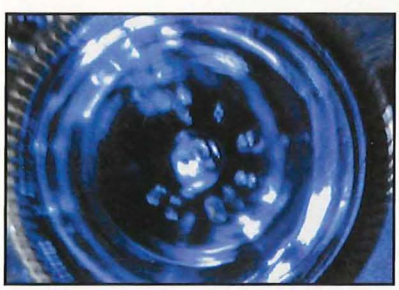
To build the cooler, Ken walled off a corner of the warehouse that measures roughly 4 by 9 feet. He insulated the room with fiberglass and three inches of spray-on urethane, then added a cooling system that he built from a refrigeration coil, a compressor and a thermostat. The system keeps the room temperature between 34 and 38 °F. He also enclosed a 6- by 3-foot space under his brew sink and rigged it to a second thermostat. A blower draws cold air from the cooler into this second fermentation chamber, which he keeps at 68 °F for ales.

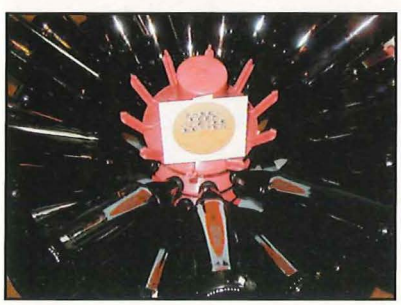
The best part of the main cooler is the door, which contains nine tap handles. Ken keeps homebrew on tap for club members, along with root beer and Gatorade. "After all, this is Texas," says Thornton. "Sometimes even homebrewers need fluids other than beer."

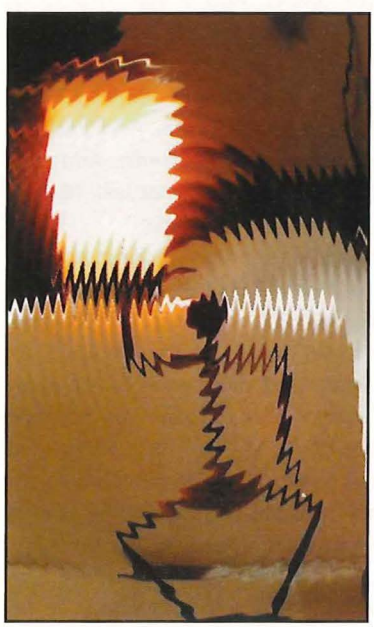
Ken's Cornelius kegs — filled with homebrew and soda — chill out in the walk-in.

Nine tap lines run through the cooler door and into the WORTS clubhouse.

homebrew PHOTOS • Ross Bangle • San Bernardino, California







Ross Bangle likes to brew his own beer. And he likes to take pictures of it. He sent us his latest shots because he thought they were groovy. So do we.

Clockwise from top left: upside-down blue bottle, a kokopelli seen through a pint of beer, and two close-up shots of empty bottles on a bottle tree.

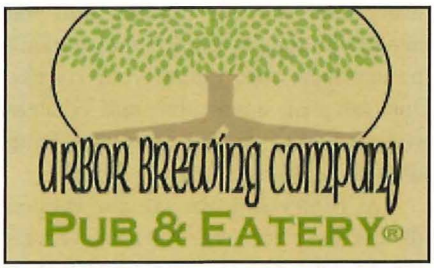
It's beer. It's art. It's beer art.

Märzen-Oktoberfest

It's all about the malt in this traditional beer

by Thomas J. Miller

Tradition dictates that Oktoberfest beers are brewed in March, lagered during the summer and served at the onset of fall. Even with the German festival season fast approaching, homebrewers still might want to take a stab at this style. Ingredients for this beer are simple — pale malt, Munich malt, and a touch of caramel malt are all you need, as brewer Matt Greff points out. You might also want to try an experimental version of this traditional brew. If so, just follow the suggestions of brewer Joe Karls. Besides the ingredients, a good German lager yeast, stable 55 °F (13 °C) fermentation temperatures, and at least four weeks of lagering around 35 °F (1.6 °C) are sure ways to make an Oktoberfest worth remembering.



BREWER: Matt Greff brews for Arbor Brewing Company in Ann Arbor, Michigan, which he opened in 1995. He has been a homebrewer since 1990.

Our Oktoberfest is basically a 5-gallon (19-L) homebrew recipe that we scaled up to production level. In fact, most of the brews we make here started out as 5-gallon (19-L) recipes. It's like a dream come true, being able to make my homebrews on a larger scale and sell them to the public. We've done quite well — just last fall, we doubled our brewing capacity.

I think an Oktoberfest should be medium-bodied, with some nice maltiness but not too sweet. There should be a hint of bitterness at the very finish. Some brewers tend to overdo the sweetness part of the beer, mostly by going too light on the finishing hops or using too much of a grain that brings out sweetness — Munich malt is an example. Our grist is meant to add malt texture without making an overly-sweet brew. The color of an Oktoberfest should be golden-reddish. The nose will be mostly malt, but with a hint of hop aroma.

Our procedure for brewing Oktoberfest is really straightforward. First, the malt bill consists of 55–60% German Pilsner malt. To contribute to the medium body and maltiness, we add 35% Munich 10 (Munich malt at 10 °L). Much more of this grain and we'd push the brew towards being too sweet. But, you want to use enough to get away from having a light-bodied brew. Finally, to round out the malt bill, plus give some caramel sweetness and color, we add caramel 20 (crystal malt at 20 °L).

We have always mashed-in at a strike temperature of 130 °F (54 °C) for 30 minutes, then added lots of hot water to get a conversion temperature at 154 °F (68 °C). Fact is, though, that we use highly-modified German grains. I'm sure we could get away with just doing a one-step infusion mash. However, this is the way we've always done it and we're happy with the results! We boil the wort for two hours, which helps this brew a lot.

My choice of hops is German Tettnanger. The reason is simple: I love them. They are used in Jever Pilsner, my favorite German beer. I find they give the beer almost what I would call "saltiness." It's a bite at the end of the beer that I really enjoy. I also believe Tettnanger hops are more gentle, and not as in-your-face, as Hersbrucker.

Our yeast selection is Ayinger yeast, which is the same as the White Labs Bock Yeast (WLP833). We found this one to be the most flocculant, which is important to us because we don't filter our beers.

Finally, we conduct primary fermentation at 55 °F (13 °C) for about two weeks. Then, we seal the tank and let CO_2 build in the tank for natural conditioning. We crash the temperature to 35 °F (1.6 °C) and let it sit for at least one month. This recipe turns out a fine brew.

RECIPES

Matt Gref's Michigan Märzen-Oktoberfest

(5 gallons /19 L, all-grain)

O.G. = 1.050 F.G. = 1.012
ABV = 4.8% SRM = 7 IBU = 25

Ingredients

6.5 lbs. (2.9 kg) 2-row German Pilsner malt (1.8 °L)
3.5 lbs. (1.6 kg) German light Munich (10 °L)
0.5 oz. (14 g) crystal malt (20 °L)
4.5 AAU Tettnanger pellet hops (bittering)
(1 oz./28 g of 4.5% alpha acids)
1.1 AAU Tettnanger pellet hops (bittering) (0.25 oz./7 g of 4.5% alpha acids)
1.1 AAU Tettnanger pellet hops (flavor) (0.25 oz./7 g of 4.5% alpha acids)
White Labs WLP833 (German Bock) yeast

Step-by-step

Mash in at a strike temperature of 130 °F (54 °C). Rest for 30 minutes then raise the mash to conversion temperature at 154 °F (68 °C). Hold for one hour and sparge at 172 °F (78 °C). Collect wort until the specific gravity falls below 1.008 or pH exceeds 5.8. Add water so you have a little over 6 gallons (23 L) of wort before the boil.

Boil the wort for two hours, adding hops at 120, 60 and 30 minutes remaining in the boil. After the boil, cool the wort with a wort chiller and aerate well.

Pitch the yeast at 65 °F (18 °C), but drop the temperature over the course of one week to 55 °F (13 °C). Hold at 55 °F (13 °C) until fermentation is complete — about two weeks. Rack and lager at 35 °F (1.6 °C). Lager for a minimum of one month, preferably longer.

HINTERLAND
BREWERY • RESTAURANT • LOUNGE

BREWER: Joe Karls has been a homebrewer for 18 years. In 1995, he completed the brewing short course at the Siebel Institute in Chicago. He has been brewing professionally for the past seven years and is now the head brewer at Hinterland Brewery in Green Bay, Wisconsin.

I recommend the following grist percentages for an Oktoberfest style brew: 75% two-row pale malt as the base malt and 25% colored specialty malts, such as caramel and Munich malts.

In my Oktoberfest brew, I go beyond even this recommendation. I'm striving to achieve a product that has many malt layers. By malt layers, I mean creating a malt balance that spans the taste and mouthfeel spectrum — from the initial (first), to the mid-palate and finally to the finish of the brew. In my Octoberfest, I use six types of malt — Hugh Baird Marris Otter malt, Dingeman's Munich malt, Dingeman's Special B malt, crystal malt (20 °L), chocolate malt and black patent malt.

This technique, however, is more of an art than a science. Homebrewers need to experiment with their brewing techniques, their recipes and their systems to see if layering works for them. Often, typical homebrewing problems like high fermentation temperatures can ruin the best layering efforts. This can reduce the complexity of what might have been a very interesting brew. So, the rule of thumb should be to produce a clean brew first and then move on to complexity.

With today's highly-modified malts, great beer in almost all styles can be achieved using the simple infusion technique. This is true for Oktoberfest style brews. That said, I have always used a temperature-controlled step mash process, although this is more out of habit than necessity. Many brewers us a step mash for brewing beers like this, but I wouldn't refrain from brewing Oktoberfest if you only do infusion brews.

I recommend that homebrewers be experimental and creative. Use traditional teaching to guide you, but not to dictate your brewing efforts. Taste every beer with the mindset that you are not judging a competition, so don't be arrogant and "judge" your results. Just keep an open mind and educate your palate to the enormous spectrum of taste sensations in your glass.

At Hinterland, we age our version of this brew in American Oak barrels for 12 days. Let me point out that my recipe suggestion of using six different malts is not overkill. My goal is to create a malty beer that is fully layered for color and mouthfeel. ■

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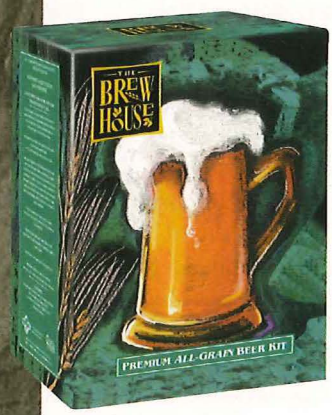

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Grain to Dust

"Bready" flavors in hefeweizens and Beano brau

Oh great and mighty Wizard of the East, please enlighten this old homebrewer. Whenever I try to crack grains dried to 300–500 °L, they turn to powder. Since the chocolate and black grains are just used for flavor and color, can I leave them whole and achieve the same results?

Charles Amos
Central Point, Oregon

I think of brewing ingredients such as chocolate malt and black patent malt like coffee beans. If you steep them without crushing them, you simply will not get the same release of color and flavor from them. On the other hand, if you turn them into powder they can create some real problems when it comes to wort collection. Finely milled coffee can cause the same problem when making espresso, especially if the coffee is packed too tightly into the little thingamabob on the espresso maker.

Most really big brewers (domestic and abroad) who make dark beers use some sort of malt extract for coloring because of the problems that dark roasted grains cause during run-off.

I have often considered treating roasted grains like coffee and making my own dark malt extract at the same time I am mashing. The malt "coffee" could be made using a wide array of kitchen gadgets, such as a strainer and several large coffee filters used to make a liner. The "coffee" would then be added to the kettle along with the wort from the mash. This would give me the color and flavor I want from dark grains and alleviate the problems with very fine particles resulting from milling them.

Unfortunately, I cannot recommend not milling the dark grains. If the small bits are causing problems, give my malt coffee idea a whirl. And if you do, drop us a line and tell us how well it worked!

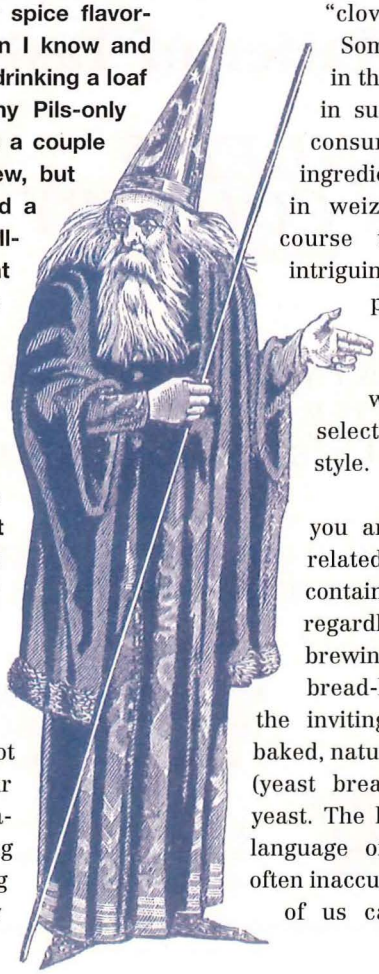
Liquid Bread

You are my last resort for continued happiness and sanity, Mr. Wizard. I recently took a business trip to southern Germany and fell in love with the locally brewed hefeweizens. Upon my return to Hawaii, I tried in vain to find anything that came even remotely close to the real thing. Neither the bottled beers I discovered (including some imported from Germany), nor any of the local microbrewed beers (Gordon Biersch and Sam Choy's), had the strong wheat/yeast flavor of the German beer. It seems that everyone emphasizes the fruit or spice flavorings, but the hefeweizen I know and love was described as "drinking a loaf of bread" by one of my Pils-only drinking buddies. I have a couple of friends that homebrew, but none of them have tried a hefeweizen. They are willing to try, but I don't want them to waste their time if it will only turn out like the local beers. All of the kit descriptions I have found emphasize the fruit or spice flavorings but do not describe the heavy wheat/yeast "bready" taste. Can you recommend a particular recipe or kit?

Brian Thompson
Honolulu, Hawaii

You're lucky I'm not overly sensitive or your "last resort" for information would be thinking about a different brewing problem! I regularly brew hefeweizens and have been pretty happy with the outcome. However, I agree that the German weizens have more of that wonderful bread-like aroma than most of the weizens available in this country. Fortunately for homebrewers, one of the major differences has to do with bottling. I'll get back to that idea in a moment, but I want to touch on the "fruity and spicy" flavors first.

Authentic German hefeweizens are brewed using malted wheat, malted barley, hops, yeast and water. Several variations exist within the wheat beer or weizenbier family and these include hefeweizen (wheat beer with yeast), kristall weizen (filtered wheat beer) and weizen bock (wheat bock). These beers all have a distinctive aroma that typically is described with the words "clove" and "banana." Some beer descriptions in this country are written in such a way that some consumers believe these ingredients are actually used in weizen beers, when of course they aren't. These intriguing flavors are instead produced by the particular yeast strains used to make weizens, making yeast selection critical for this style.



The bread-like flavor you are describing is also related to yeast. When beer contains a fair bit of yeast — regardless of the particular brewing strain — it has a bread-like flavor. After all, the inviting aroma of freshly-baked, naturally-leavened breads (yeast breads) is the smell of yeast. The language of food is a language of association and is often inaccurate. The aroma most of us call "bready" should

really be called "yeasty," but the aroma is typically associated with bread and not yeast.

My point is that in order to have that loaf-of-bread-in-a-glass sensation, you need a slug of yeast in your glass.

I know the Gordon-Biersch family of breweries and will assume Sam Choy's has a similar set-up . . . I think a trip to Hawaii is needed. Brewpubs like Gordon Biersch in Honolulu store beer in large serving tanks instead of using kegs. Serving tanks are much more convenient than kegs in a brewpub because they require less labor to fill and clean since one commercial serving tank may hold the equivalent of 15–60 kegs of beer.

Serving tanks work great for filtered beers, but have their limitations when it comes to unfiltered beers. The main problem is that yeast tends to settle in serving tanks over time and the first beer poured and the last beer poured are usually different. Specifically, the last beer will have much less yeast than the first.

This is why most brewpub hefeweizens lack the intense bread-like aroma of bottled weizens. This is not to imply that bottling is the solution, but it is a darn good start if you want that aroma. Really good weizen brewers pay special attention to the amount of yeast being put in the bottle. Too much yeast and the beer looks bad and runs the risk of off-flavors coming from autolysis. Too little yeast will turn the hefeweizen into a pseudo-hefeweizen.

Many commercial brewers remove the weizen (ale) yeast from the beer, usually with centrifugation, then dose lager yeast and wort or priming sugar for the bottle conditioning. The advantage of using lager yeast is that lager strains tend to be more powdery than ale strains.

The pouring ritual of weizen beer begins with pouring most of the beer into the glass. Next, you lay the bottle on the bar and roll it to get all the yeast off of the bottom and then to pour this last bit of yeast-rich beer into the glass. This clearly cannot be done in a brewpub when beer is served from serving tanks. The other thing about hefeweizen is that the carbonation level is

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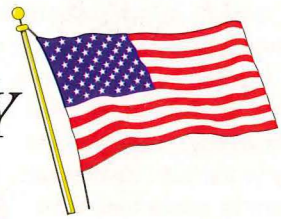

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higher than regular beers. Since highly carbonated beers are difficult to pour from a beer tap, many draught weizens have less carbonation than their bottled counterparts.

My tips on brewing hefeweizen are simple.

- Begin by buying one of the many weizen strains sold by the yeast suppliers and pay attention to the recommended fermentation temperature. The level of banana and clove aromas can be increased by fermenting at higher temperatures.

- Use high quality wheat and barley malt or high quality kits. I'm an all-grain advocate because I feel that the techniques used to make syrups and dry extracts change wort flavor in some beer styles, notably the lighter styles. Hefeweizen — in spite of its pungent yeast-derived aroma — is a lighter style and can benefit from all-grain brewing. When going all-grain, I suggest red wheat for weizens, because it usually has a higher protein content and makes for prettier foam.

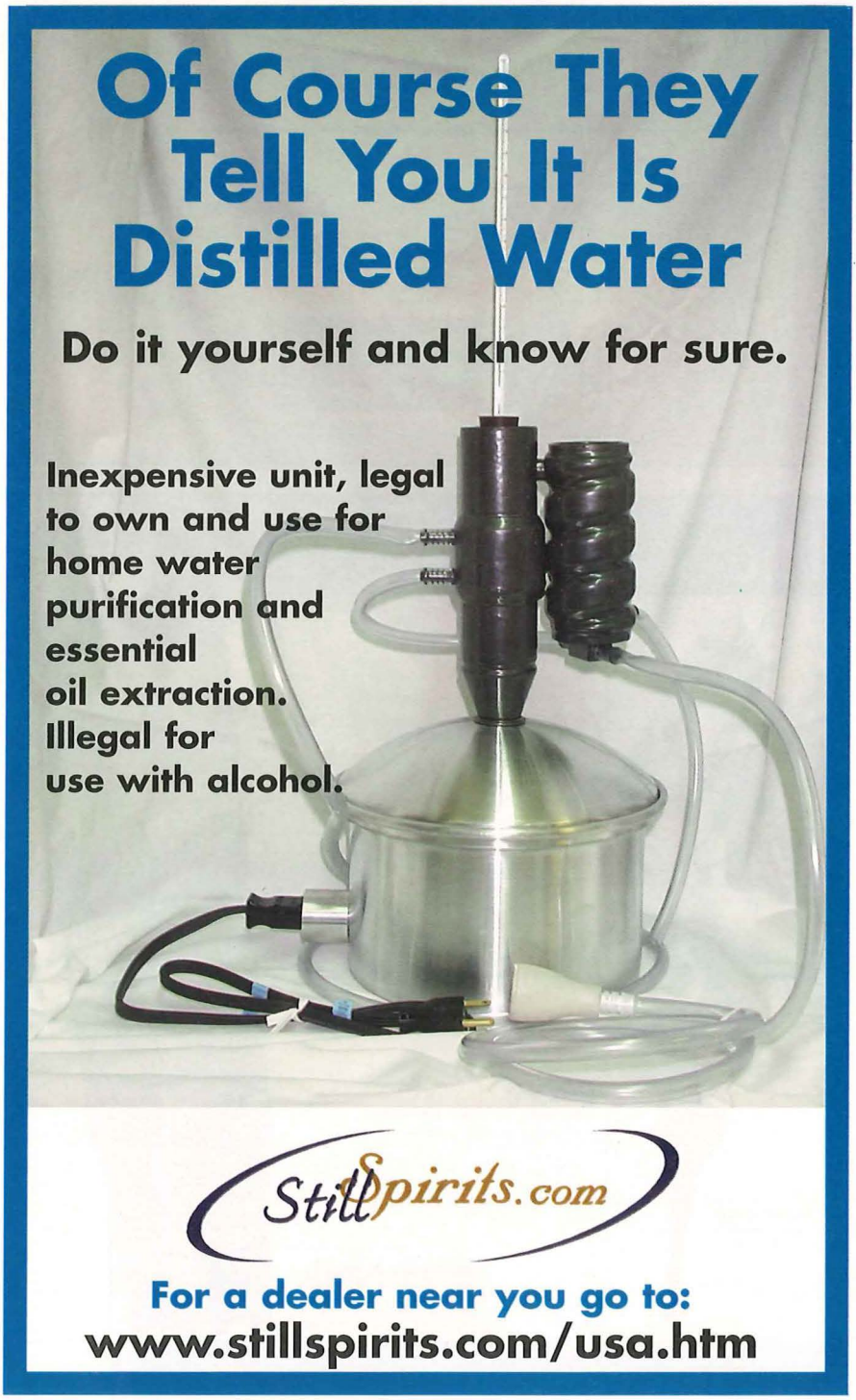
- Don't over-hop your weizen! This beer is about yeast aroma and malt. Hops should only be used to balance the beer. The style is "hefe" weizen, not "hoppy" weizen.

- Allow the fermentation to run to completion before bottling, but don't let the beer sit around long enough to significantly clear. That will occur in the bottle and you will have enough yeast on the bottom to stir up when pouring.

- Shoot for a carbonation level of about 3 volumes. This is about 20% more than most ales and lagers. Although German commercial brewers prime with wort, I would use priming sugar or DME since priming with wort is very difficult to do with accuracy.

Beano Brau

I love to drink my husband's homebrew. But, as with many women, I like to watch my girlish figure. In the March 2001 issue of BYO, I read an article about the use of Beano tablets in the fermenter to lower the carbohydrates. Noticing that I have been having to work a lot harder, watching what I eat and exercising to keep my weight down, my husband decided to try to help me out and make a batch of Beano beer for me. It tastes great as he made my favorite IPA with lots of hops, but I was wondering if this method has been tested to find out if the resulting beer really has a lower content of carbohydrates. The recipe and mash schedule is as follows: 6 lbs. (2.7 kg) pale malt, 0.5 lbs. (0.22 kg) Munich, 0.5 lbs. (0.22 kg) dextrine, 0.25 lbs. (0.11 kg) wheat and crystal malt for color. It was mashed at 140 °F (60 °C) for one hour, then 150 °F (66 °C) for 30 minutes. Four Beano tablets were added to the primary fermenter for a 5



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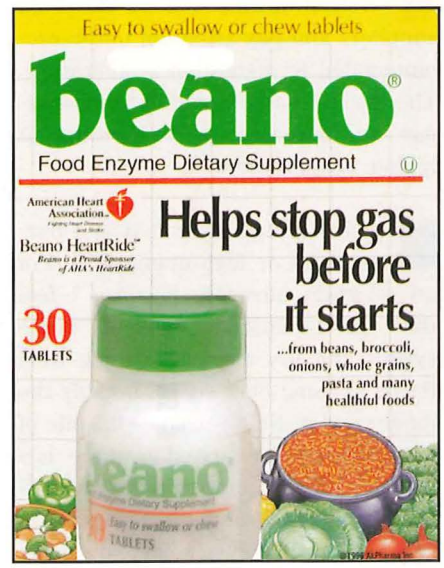
"Help Me, Mr. Wizard"

gallon (19 L) batch. I understand that the Munich is as fermentable as the pale malt, but I am wondering how much the crystal, dextrine and wheat might contribute to carbohydrates. Will the Beano tablets take care of this? Please help me, Mr. Wizard! I sure would like to know if this really works.

Paula Johnson
Deer Island, Oregon



Beano Brau . . . now that's a real blast from the past. I remember reading this article and thought the idea seemed credible, but never gave it a try since I'm not even remotely concerned with my girlish figure!

Before I delve into this question, I want to point out that all types of malt, pale and Munich included, produce wort with both fermentable and unfermentable sugars. It's the unfermentable sugars that are responsible for beer's carbohydrate content. Malt type, mashing schedule and yeast strain all influence the carbohydrate content of the beer. Your hubby's beer had a really solid rest at 140 °F (60 °C) and that really helps when trying to produce a very fermentable wort.

There does appear to be a real demand for low carbohydrate beers these days. Light beer sales are on the increase and new brands continue to emerge. Sam Adams Light and Michelob Ultra are two new brands that come to mind. Just because a beer is low in carbohydrates does not mean that it is prohibited from having flavor.

I think that Sam Adams Light is one of the few "light beers" on the market brewed with fuller flavor in mind (mainly hoppiness). Guinness Pub Draught is actually pretty darn low in carbohydrates and alcohol, although Guinness certainly doesn't want to market its famous stout as "light." But I digress.

Soon after receiving your question, I decided to conduct "The Beano Challenge." The experiment was pretty simple and was conducted in a brewpub. Five hundred gallons of wheat wort with an original gravity of 11.25 °Plato (specific gravity 1.045) and 15 IBUs was brewed using the standard brewing procedures for this beer at the brewery where I work. The wort was cooled to 66 °F (18 °C), aerated using sterile air to contain approximately 8 mg oxygen per liter of wort and pitched with White Labs WLP 001 (California Ale) yeast. Primary fermentation lasted 3 days at 66 °F (19 °C) and the gravity after primary was 2.8 °Plato (specific gravity 1.011). We spund or cap our tanks at this point in the process for natural carbonation and this beer was treated no differently. The wheat beer remained at 66 °F (19 °C) for four additional days while carbonation and diacetyl reduction occurred. The gravity had now dropped to 2.0° Plato (specific gravity 1.008) and it was time to cool the tank to 52 °F (11 °C).

Once the beer temperature dropped to 52 °F (11 °C) and stayed at this temperature for 1 day, it was time for the Beano challenge. We took a 0.5 gallon (2 L) sample from the tank for our control sample and a 5 gallon (19 L) sample for our experimental sample. Four Beano tablets were crushed and added to the experimental sample at this point.

Both control and experimental samples were in clear glass containers fit with air locks and held at the same 70 °F (21 °C) for the next 2 weeks. Neither air lock was removed during the 2-week rest. The Beano experimental container slowly bubbled for about 10 days after the Beano tablets were added and there appeared to be a small yeast head on the surface of the beer during this period. The control sample had no yeast head at any time during the test period and rapidly cleared due to yeast flocculation shortly after the sample was taken from the large fermenter.

The results were simple and convincing. The control sample had a final gravity of 1.9° Plato (specific gravity 1.0076); the same final gravity of the large batch of beer in the stainless steel fermenter. This is the normal finish gravity for our unfiltered wheat beer. The experimental sample treated with Beano had a finish gravity of 0.9° Plato (1.0036). This beer has been brewed over 100 times and it has never finished much lower than 1.8° Plato (1.0072). Although this experiment was conducted only once and has absolutely no statistical validity (replicates are required for

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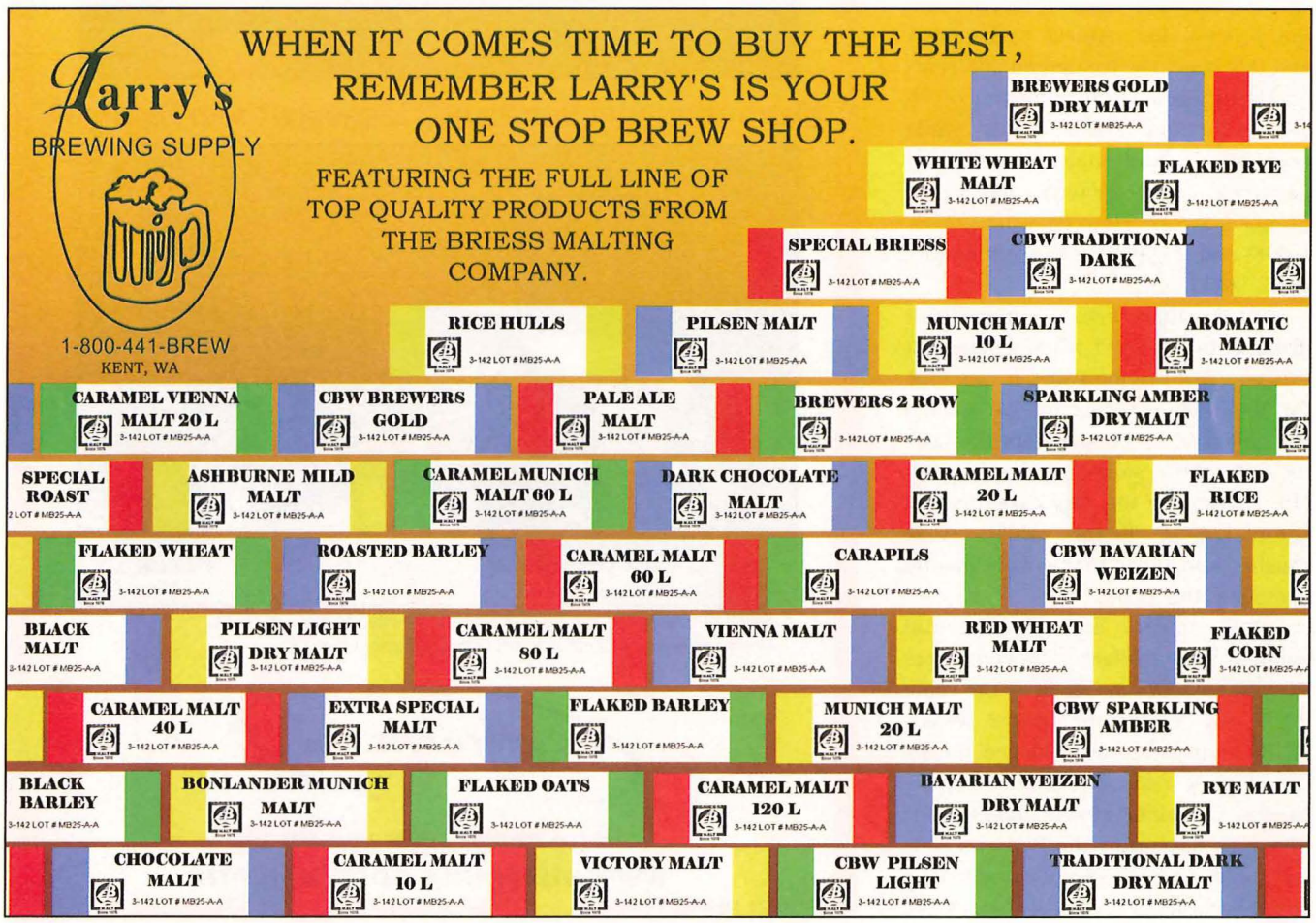
statistical validation), I'm now a believer in Beano! Long may it rule!

The science behind the action is simple, well-known and used by some commercial brewers to make light beer. The key ingredient in Beano is a debranching enzyme. When added to beer or wort, the debranching enzyme (amyloglucosidase) renders unfermentable sugars into fermentable sugars. Almost all of the carbohydrates found in pale malt, rice and corn can be completely fermented by yeast when amyloglucosidase is added to the mash or fermenation. Some special malts, especially crystal malts, contain "Maillard reaction products" (MRPs). These are colored compounds formed by the reaction of amino acids and carbohydrates. These compounds are not fermentable, are not rendered fermentable by amyloglucosidase and most of the MRPs are not converted to energy when consumed by beer drinkers. The compounds do, however, increase the specific gravity of wort and beer. In other words, your light IPA may not wind up with the same gravity as the same recipe brewed without crystal malt, but the caloric value is most likely the same.

So speaking of caloric value, how does our Beano wheat compare to the regular version? Both beers had the same OG, but the Beano wheat has a higher alcohol content (~5.2% ABV compared to ~4.7% ABV) and a lower carbohydrate content (~4.9 grams versus ~10.3 grams per bottle). I don't want to get into the specifics of estimating the calories in beer, but my calculations estimate the control beer at 133 calories per 12 ounce (355 mL) serving and the Beano wheat at 122 calories per 12 ounce (355 mL) serving. That's a reduction in calories of about 8% and a reduction in carbohydrates of 53%. Although the reduction in calories is not huge, it is important to recognize the control beer was fairly lean before the Beano treatment. The 53% reduction in carbohydrate is a bit more substantial. This test is certainly not definitive, but does seem to indicate that Beano does indeed work. I think I will continue tinkering with Beano. My next test will be related to beer farts! I am sure the marketing sharks at the big breweries could have a winning combination if they market a beer-fartless brew that is also low in carbohydrate and calories. ■

Do you have a question for Mister Wizard? Write to him c/o Brew Your Own, 5053 Main Street, Suite A, Manchester Center, VT 05255 or send your e-mail to wiz@byo.com. If you submit your question by e-mail, please include your full name and hometown. In every issue, the Wizard will select a few questions for publication. Unfortunately, he can't respond to questions personally. Sorry!



Sour Cherry Ale

It's dark. It's delicious. It's a fab summer beer.

by Horst D. Dornbusch

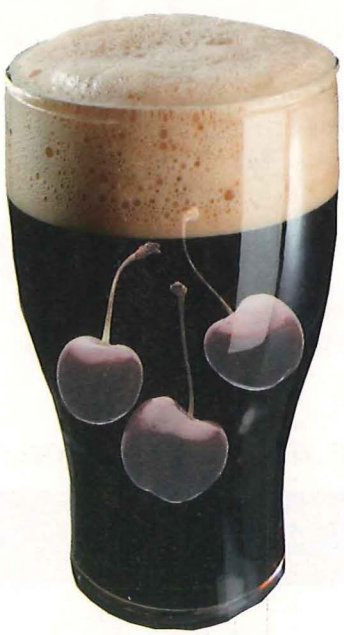
When my friend Steve Clarke called in December 2000 to invite me to a Christmas party, he mentioned that Tom Lampi was bringing some of his cherry ale. I knew Tom was an avid homebrewer, but I am generally not a friend of fruit beers — so I had no great expectations for that beer. Well, was I in for a surprise! Tom had made a very opaque, almost black, ale with just a hint of cherry. It was delicious and by far the very best beverage at the party. Later, after taking him out for some beers at a local brewpub, Tom granted me permission to divulge the secrets of his beer to you.

Cherries

You could brew with either sweet or sour cherries, but for a complex and dark cherry ale, you ought to be more interested in the fruity acids of the cherry than in its fermentable sugars.

Dark Cherry Ale by the numbers

OG	1.062-1.065 (15.5-16.25°P)
FG	approx. 1.016 (4°P)
SRM	approx. 100
IBU	approx. 55
ABV	around 7%



In our recipes, therefore, sour cherries are preferable to sweet ones. Sour cherries usually appear in stores between late June and early August. If available, one of the best cherry varieties for your ale is the choke cherry *(Prunus virginiana)*.

Like all fruit, cherries contain pectin (carboxymethyl cellulose). Pectin does not harm your brew's flavor, but it tends to cause a haze in cold, finished beer. Fortunately, the pectin content of cherries is relatively low. Underripe fruit, however, is always laden with pectin. So, purchase the ripest cherries you can find.

Because of the variability of the fruit, it is difficult to specify the precise amount of fruit you will need. Use the numbers given in the recipes as a guideline, not a hard and fast rule.

Water, Grain, Hops and Yeast

The initial steps in making a cherry ale are indistinguishable from those for a "normal" beer. From the boil forward the procedures are identical for all-grain and extract beers.

The grain bill of this beer is not too different from that of a dry stout, which means it contains about five percent of black malt. Black patent malt will work, but the milder — yet equally dark — Weyermann dehusked Carafa III from Germany is preferable, because it adds fewer harsh and roasted notes to the brew.

Because the beer's taste experience "lives" off the juxtaposition between the fruity, acidic notes from the cherries and the malty, chewy notes from the dark grains, the bittering hops should be relatively neutral. That's the reason for the Bullion, which produces a well-rounded bitterness. For aroma hops, too, we must be careful not to introduce too succinct a taste sensation. The citrusey Tettnanger augments the dominant flavor combination very well and even gives it just a touch of a bite. Willamette hops from the Northwest would also fit the bill.

RECIPES

Tom's Cherry Ale

(5 gallon / 19 liters, all grain)

OG = 1.062–1.065 FG = 1.016
SRM = 44 IBU = 53 ABV = 6.1

Ingredients

9.0 lbs. (4.1 kg) British or Belgian two-row ale malt (2-4 °L)
1.0 lb. (0.45 kg) caramel malt (10 °L or 20 °L)
0.5 lb. (0.23 kg) roasted barley (275-325 °L)
0.5 lb. (0.23 kg) black patent malt (475-525 °L) or (preferably) Weyermann dehusked Carafa III (488-563 °L)
10.0 lbs. (4.5 kg) sour cherries
14 AAU Bullion hops (bittering) (1.75 oz./50 g of 8% alpha acid)
0.5 oz. (14 g) Tettnanger hops (flavor)
1 tsp. Irish moss
Wyeast 1084 (Irish Ale) or White Labs WLP004 (Irish Ale) yeast
40 oz. (1.2 L) of sterile wort (for kräusen/priming)

Step-by-step

Bring 2.5 gallons of the water to 132 °F (56 °C) and mash in. The mash temperature is likely to drop to about 122 °F (50 °C). Let stand for a 30-minute protein rest. Meanwhile, heat the remaining 5 gallons (19 L) of water to 168 °F (76 °C). Add portions of this water to the mash until it reaches 153-158 °F (67–70 °C). Let the mash rest for saccharification for another 20 minutes. Then sparge the mash with the remaining water, making sure that the mash temperature reaches at least 165 °F (74 °C). Keep sparging until the kettle gravity is about 1.056-1.59. This starting gravity at the beginning of the boil is 10% below the beer's OG at the end of the boil of 1.062-1.065 and allows for evaporation losses.

(continued on page 22)

The yeast, too, should be a solid but humble workhorse. It should be only slightly fruity and somewhat restrained in the diacetyl department. Wyeast 1084 (Irish Ale) or White Labs WLP-004 (Irish Ale) are good choices.

Extract Cherry Ale Tips

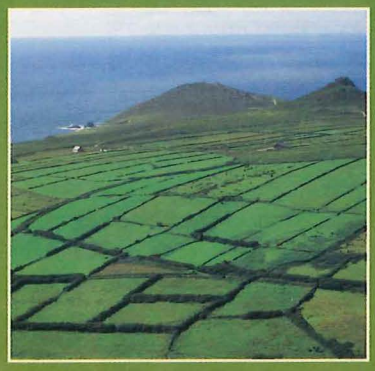
To create a stout-like base wort in which to ferment the macerated cherries, the extract brewer has several choices. The simplest one is to replace the entire grain bill with canned stout extract. This convenience, however, is purchased at the expense of two concessions. You are stuck with the extract manufacturer's choice for black malt, which may give your cherry brew more acrid flavors than might be ideal. You will also be limited by the manufacturer's choice of bittering hops, because there simply are no unhopped canned stout malts on the market. If you choose this road, simply leave out the bittering hops. Alternatively, you can split your extract roughly half and half between a standard (unhopped) pale ale malt and a (hopped) stout malt, and then reduce the bittering hop addition by one-half. You can then accept that your ale will be slightly lighter than specified, or you can add some vacuum-evaporated, extremely condensed color malt extract, which has just arrived on the homebrew market.

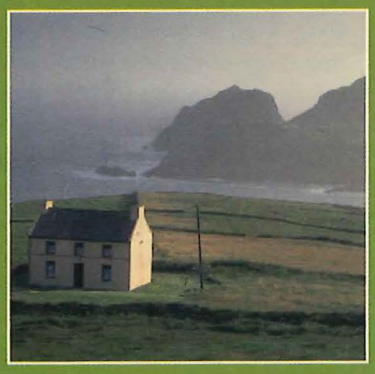
Commercial brewers — including some of the very large, international ones — have been using such color malt extracts for decades to color-correct their darker beers, both ales and lagers. These specialty extracts are unhopped and allow brewers to add darkness to their brew naturally without having to add too many roasted notes as well.

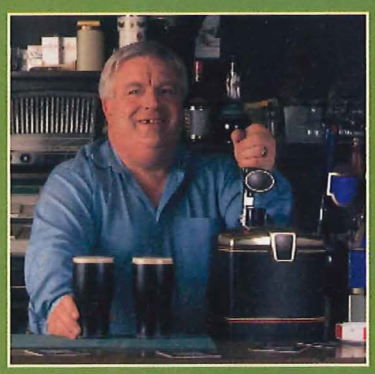
I am aware of only two malting companies that offer such a product in the United States. The Briess Malting Company of Chilton, Wisconsin offers a color malt extract in large containers for commercial brewers, and the Weyermann Malting Company of Bamberg, Germany, offers another color malt extract in both commercial-size and homebrew-size containers.

The Briess product is called a "natural barley malt color liquid" and sold under the trademark of Maltoferm. It has a slightly smoky flavor and a color rating of about 7,000 °L. The Weyermann product is called a "color malt extract" and sold under the trademark SINAMAR. The Weyermann product has a color rating of about 3,200–3,375 °L, which is less than half that of the Briess product. But, because it is made entire from dehusked CARAFA II malt (with a color rating of 375–450 °L), SINAMAR has almost no flavor. The SINAMAR wort is bottom-fermented to an alcohol level of roughly 1% and an FG of 1.040, at which point the finished black "beer" is vacuum-evaporated at 162 °F (72 °C).

Crosby & Baker started to distribute SINAMAR to homebrew supply stores in early June 2003. It comes in







MOUNTMELLICK BEERKITS

THE GENUINE ARTICLE

more Cherry Ale recipes

(continued from page 19)

Boil for 1 hour. Add bittering hops 15 minutes into the boil. At shut-down, siphon off 40 oz. (1.2 L) of hot wort into a clean, sealable container. Close the container, let it cool, and store in the refrigerator until bottling time. Then add 1 tsp. of Irish moss to the kettle and lower the prepared bag of macerated cherries into the hot wort. Also pour in any cherry juice from the bowl, because it, too, must be sterilized. Leave the cherries in the wort for about 15 minutes. Then remove the bag and place them into a clean, sanitized bowl to capture the bleeding juices for later use. Do not re-use the bowl that held the raw cherries, because it is contaminated.

Add the finishing hops to the wort immediately after you have removed the cherries. Let the hot wort rest for another 5 minutes. Then siphon it into an open fermenter and add the fruit in the bag as well as any juices that may have bled out of the bag. Cover the primary fermenter with aluminum foil to keep out any dust and wait until the wort has cooled off. This could take a few hours. The length of this wait, of course, depends on your ambient temperature. Also, placing the fermenter in a tub filled with cold water or ice, naturally shortens the cooling time. Pitch the yeast, once the wort has reached room temperature. Ferment at 65-70 °F (18–21 °C) for both primary and secondary fermentation.

During primary fermentation, which may last about 5 to 7 days, scum will appear on the surface of the ferment. Skim it off occasionally. Pull the fruit bag(s) out of the ferment at the end of primary fermentation, which should be at or near a gravity of 1.016. But do not squeeze the fruit bag(s), because you do not want to introduce pectin into your beer at this point! Rack the beer carefully off the debris into a carboy, and let it mature for another two weeks.

Finally, pour the refrigerated-and still sterile-kräusen solution into a clean carboy or Cornelius keg and rack the finished brew into the priming wort for mixing. For bottle conditioning, package the beer immediately. For later keg dispensing, simply let the beer condition in the Cornelius keg. Keep the beer at room temperature for two or three days to "jump start" conditioning, then store it at cellar temperature for another two weeks, at which point all conditioning should be finished. The beer is now drinkable, but it improves with age. If stored cool, it will keep for about a year, but the hop bitterness will start to recede and the brew's fruitiness will become gradually more pronounced.

Extract Option:

Replace the grains with 6.6 lbs. (3.0 kg) stout ale malt extract (hopped). Alternately, you can replace the grains with 3.3 lbs. (1.5 kg) pale ale malt extract (unhopped), 3.3 lbs. (1.5 kg) stout malt extract (hopped) and 12. 5 oz. (0.35 kg) Weyermann SINAMAR roast malt extract. Either way, use 10 lbs. (4.5 kg) sour cherries.

Bring 4 gallons (15 L) of water to a boil and add malt extracts. Follow the all-grain directions from this point.

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Because color malt extracts are veritable color bombs, a little goes a long way. For instance, it takes only about 0.25 oz. (7.1 g) of SINAMAR to darken the color of 5 gallons (19 liters) of wort by about 1 °L. To replace the coloring effect of all the black (patent) malt in our cherry ale with SINAMAR color malt extract, therefore, you need about approximately 12.5 oz. (354 g).

The availability of color malt extract in homebrew-size containers is great news especially for home extract brewers. This opens up an entirely new world of pure extract brewing — a world which has previously been only open to partial-mash and all-grain brewers who were prepared to either mash their own malts or at least to steep some specialty malts in their brewing liquor.

Cherry Meets Wort

To prepare the cherries for brewing, wash them thoroughly in cold water and remove all stems. Also pick out any leaves, which is the more important if you use choke cherries, because the leaves of that cherry variety are poisonous. Macerate the fruit in a bowl with a potato masher. Stuff the cherry pulp, including the pits, into one or more grain steeping bags.

The cherry aspect of the brew enters the picture for the first time only at the end of the boil. The cherries meet the wort in two separate encounters, once briefly in the hot kettle to kill any wild yeasts and molds that are bound to lead a parasitic existence on the fruit, and once for about five to seven days in the fermenter to extract the flavors and allow the yeast to metabolize the fruit sugars. The hot treatment happens shortly after shutdown, as the wort is cooling off but is still hot. Lower the bag of cherries into the hot wort to eradicate all the microbes the fruit is sure to harbor. The destruction of such spoilage agents occurs as the temperature rises above roughly 140°F (60°C). At this temperature, of course, the fruit's pectins are also poised to coagulate. Some of the pectin, however, will be trapped in the bag while some of it will be helped on its trip into the trub by the use of Irish moss. Leave the fruit in the hot wort for about 15 minutes, before pulling it out. The bags of pulp should now be sufficiently free of bacteria that the fruit can re-introduced into the wort for the duration of the primary fermentation.

Because of the fruity acidity, the brew ages well. It is drinkable within about two weeks after priming and bottling or kegging, but it mellows and improves for at least three months. Consider following my friend Tom's example and save a portion of this summer brew for the Christmas holidays. In fact, I think it would even be a great alternative to champagne on New Year's Eve. ■

Horst Dornbusch writes the Style Profile column in every issue of BYO.

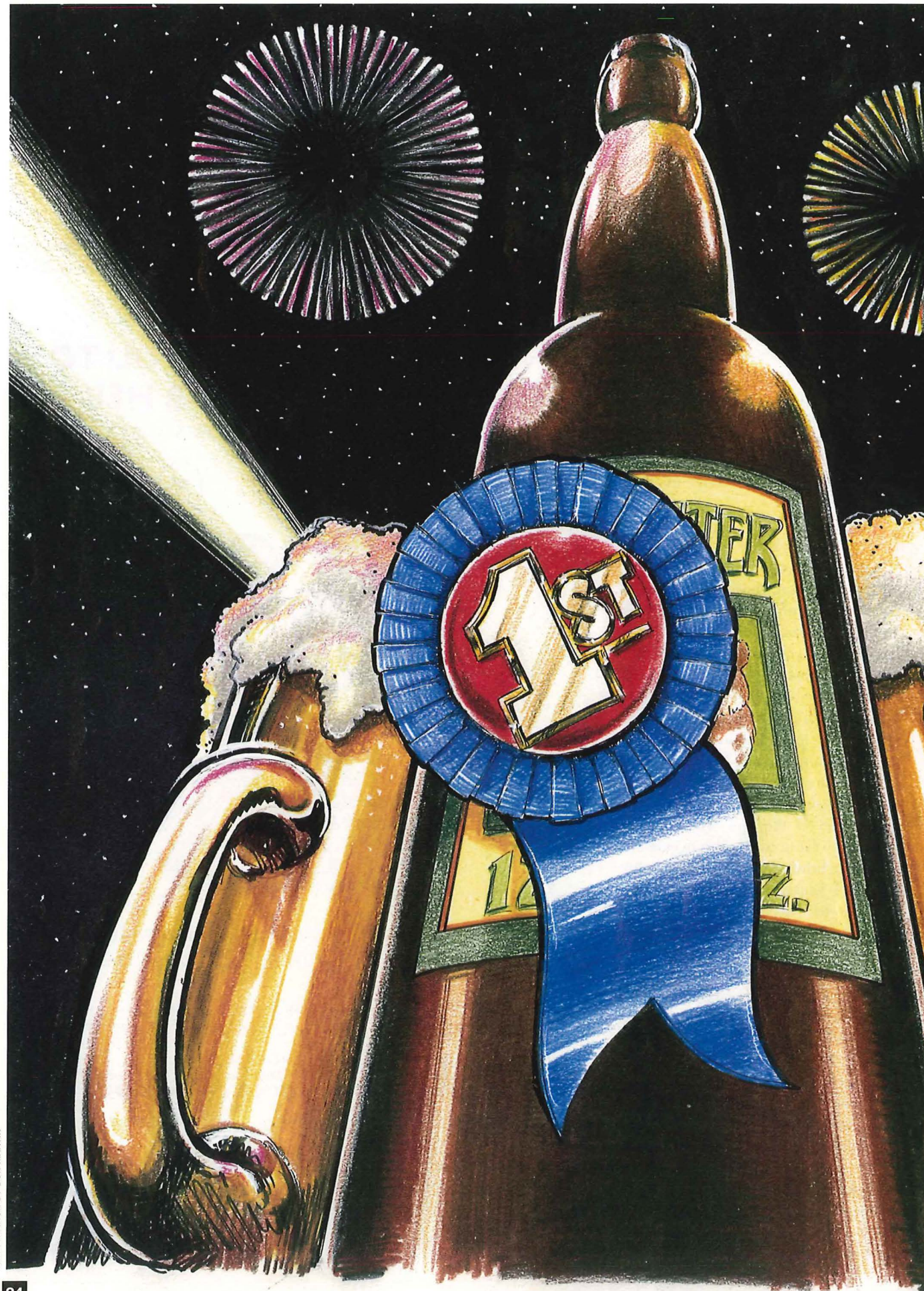
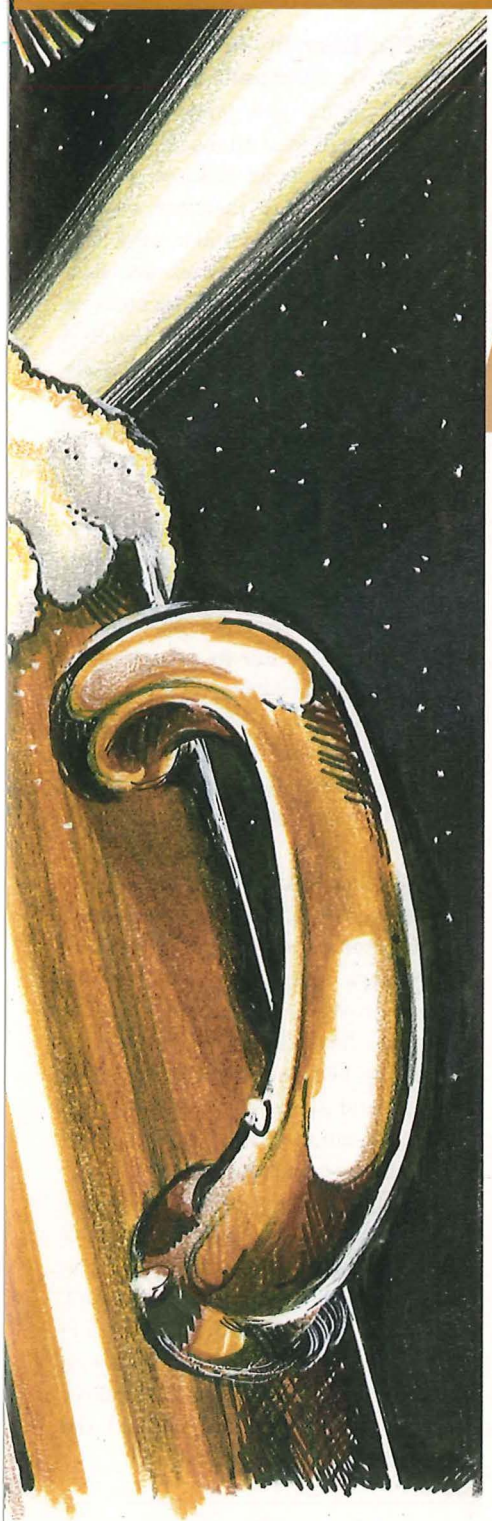


ILLUSTRATION BY DON MARTIN

TEST your METTLE (and win a medal)!

TIPS, TECHNIQUES and AWARD-WINNING ADVICE on entering your homebrew in a competition

By **Marty Nachel**



When I started brewing my own beer many yeast generations ago, I couldn't wait to get feedback on my brews from family, friends and neighbors. Unfortunately, not all of it (actually, not much of it) was complimentary, and practically none of it was helpful. Wrapped in my nascent beer snobbery, I consoled myself with the thought that these people were mere beer peons, accustomed to numbing their brains and their palates with chilled swill-water. "What do they know?" I'd sniff.

Undaunted by half-hearted compliments and feigned nods of approval, I eventually searched out homebrew competitions in my area. I was ready and willing to take my licking from the pros. I dutifully filled out the required paperwork, signed and dated a check, properly boxed up my entry bottles and drove them over to the local UPS dock for delivery (my, how times haven't changed!).

I remember winning my first ribbon in 1987. It was a pale ale that took second place in the category, one of only four categories judged at that event. Nevertheless, my beer had bested others ... and I wanted to repeat the accomplishment as often as I could. Sixteen years later, that little red ribbon now hangs proudly among nearly 50 other brewing awards that decorate my store's back wall.

I was also anxious to participate in the other side of competitions. After becoming a certified beer judge, I worked hard and traveled often to events in my area. Educationally speaking, there's nothing quite like learning about competitive brewing from the inside out. Becoming a beer judge undoubtedly made me a better brewer. I'd like to share what I've learned, both as a brewer and a beer judge, to help you gear up for beer competitions.

SIX Quick Competition Tips

ONE: Stay true to style

One thing I learned early in my competitive career is that what you set out to brew is not always what you end up making. If you fail to achieve the appropriate gravity in your planned Scottish Export Ale, it might only make the grade as a Scottish Heavy in competition. For coming up short on IBU's, your supposed IPA may be an APA to an experienced judge's palate. And for using that higher Lovibond crystal malt in your hefeweizen, you may have inadvertently strayed into dunkelweizen territory, according to the style guidelines.

I recall a situation long ago where I was judging a beer in the Märzen/Oktoberfest category. It was fruity, floral, buttery and loaded with a whole bunch of other aromas and flavors that suggested it was anything but Oktoberfest. Later, when I had the opportunity to discuss this brew with its creator, I learned that the beer had been warm-fermented with a packet of dry ale yeast. When I pointed out this apparent fermentation faux pas to the novice brewer, his not-entirely-unexpected response was, "But the kit said Oktoberfest on the label!" Caveat Emptor — let the buyer (and homebrewer) beware.

If you take homebrew competition seriously (and who doesn't?) it's imper-

ative that you have at least a rudimentary knowledge of beer styles. Since the vast majority of sanctioned homebrew competitions across the United States operate in accordance with Beer Judge Certification Program (BJCP) rules and guidelines, it makes good sense to familiarize yourself with these beer style guidelines. You can find all of this information and more on the BJCP website at: www.BJCP.org.

TWO: Keep it fresh

Freshness counts! Though it might seem to belabor the obvious, using fresh ingredients is another imperative for brewing competition-quality beer. Using old hops, grains and malt extract to brew beer makes no more sense than using old and stale ingredients to create a gourmet meal. Buy and use the best-quality and freshest ingredients available to you.

THREE: Sip before you ship

Be sure to re-taste your brew just prior to entering it into a competition — a beer that tasted good and hoppy last month may have suffered a notable loss of hop flavor and aroma since. Likewise, a gently carbonated beer may have kicked on the carbon-dioxide afterburners in the last few weeks and it now may border on explosive.

It's a good idea to taste your beer with the style guidelines right in front of you so you can match your beer point-for-point with the parameters of the style. Keep in mind that several sub-style parameters for gravity, color and bittering — such as those in the bitter category — change very little from one sub-style to the next, so evaluate your beer intently. Similarly, consider the possibility that your beer may safely straddle two similar styles or sub-styles and be a legitimate contender in either category. There are no rules against entering the same beer in more than one category.

If you lack confidence in your palate or objectivity, have your beer tasted by discerning friends or fellow brewers. Be flexible; remember that your beer has to conform to the dictates of the style guidelines. This means that you may have to enter what you've been calling a porter in the brown ale category.

FOUR: Let history be your guide

Learn from past experiences. If you've entered a beer in a previous competition, you should have received the scoresheet with the judges' comments on it. Keep these on file and refer back to them — especially if you intend to brew the same style beer again. If you are not familiar with the peculiar jargon used on scoresheets or used by beer judges in their commentary, it's in your best interest to learn this judging vocabulary.

FIVE: Timing is everything

There are two basic types of brewers when it comes to competition: those who brew a beer and casually enter it into competition, and those who brew beer with competition in mind. Members of the first group brew the types of beers they like when they have the time and resources. If that beer seems worthy of competition and the brewer is motivated enough, he or she will send it off to compete in hopes that an award might be in the offing. Members of the second group often schedule their brew sessions according to upcoming competition calendar entry-date deadlines. They are intent on nailing a specific style and have every intention of winning something — if not everything.

If you identify with the first group, there's little I can say that will change your motivation; if you identify with the second group, however, pay attention. As I've already said, freshness counts and timing is everything; this means you'll probably want to plan a brewing schedule according to upcoming competitions (check with your local homebrew club or do an online search). Keep in mind appropriate aging and lagering periods for high gravity, specialty and cold-fermented brews.

SIX: Size does matter

Another consideration is the size of the competition. If you are simply on a ribbon quest, it's always easier to be a big fish in a small pond. Seek out the smaller, local events across the country that attract fewer entries. If, however, you want to go "head-to-head" — so to speak — with the best brewers in the country, shoot for the biggest and the best competitions. Awards and judge feedback value and quality are usually commensurate with the size of the competition. Just remember that it's kind of like playing the lottery; as the size of the jackpot increases, your odds of winning decrease.

Best-Bet Beer Styles to Brew for Competition

Beer judges and long-time competitors have kind of an inside track on how to improve your chances of winning an award. For instance, certain beer style categories make easy targets, while other categories are best avoided. Much of this assessment is also based on numbers. Some popular, easy-to-brew categories, such as pale ale, are perennially saturated with entries. This means that your odds of winning in this category are usually diminished.

Conversely, there are other categories that typically don't get many entries, thus increasing your odds of winning. There is a caveat to this, however — many of the low-entry categories, not surprisingly, are also the more difficult-to-brew beer categories (if you've mastered the Berliner weisse style, there are plenty of awards out there with your name on them).

ONE: Go big, dark and hoppy

Using sweeping generalizations, I would recommend brewing and entering big, dark, hoppy ales. Big — meaning high gravity — because they tend to have more flavor and complexity, dark and hoppy because fewer flaws show through, and ales because they tend to exhibit a much wider spectrum of acceptable aromas and flavors.

So which categories should be targeted and which should be avoided? My list of targeted styles would include: American brown ale (dark and hoppy), Irish dry stout (dark and complex), foreign style stout (dark and complex), Belgian strong ale (big and complex), dunkelweizen (dark and complex) and California common beer (hoppy).

TWO: Think twice about lagers

Which categories should be avoided? Well, I hate to discourage anyone from expanding their brewing horizons, but if you are on the hunt for awards, you may want to limit your focus. On the list of styles to avoid would be most of the lager categories — especially the light colored and bodied American sub-styles. Not only are these beers difficult to brew, their lightness of body and color betray every minute flaw in the beer.

Lagers in general have what some might call a "narrow" flavor profile, meaning that due to the long and cold lagering process these beer styles exhibit very little, if any, fermentation characteristics. These beers are generally clean and refined; their aroma and flavor is based almost entirely on the malt and hops (what little there may be) and occasionally the water quality, with very little character attributed to the yeast or fermentation.

If you are determined to make a lager beer, I would recommend shooting for doppelbock, schwarzbier, German-style Pilsner and American dark lager. The doppelbock and schwarzbier follow my earlier prescription of big and dark. The German style Pilsner is relatively easy to nail due to the fact that it is drier and hoppier than the other Pilsner styles and doesn't necessarily require a decoction mash. The American dark lager is also somewhat dry and the round malty notes of a Munich dunkel are not expected of it.

THREE: Score in specialty beers

There are a few more styles I would like to recommend, but not without a full explanation and caution. Specialty beers are given a fairly wide berth; their parameters may run all over the map. This can work in the brewer's favor, but specialty beers also require the brewer to exercise a little restraint.

Fruit and vegetable beers should adequately represent their spotlighted fruit or vegetable without completely overshadowing the underlying beer. Balance and drinkability are important; overly sweet or sour fruit beers don't usually score well. These suggestions also hold true for herbed and spiced beer. When it comes to spicing your brew, less is usually more. Overly aggressive herbed and spiced beers are not particularly enjoyable to drink and may take a long time to age and meld the spice character into the beer.

Taste your beer with the style **guidelines** in front of you, so you can **match your beer** with the **parameters** of the style.

Be patient, though — sometimes good beers turn into outstanding beers over time. I once had a seven-year-old spiced beer take first place in the specialty category.

FOUR: Smoke it if you got it

Another specialty style I'd like to recommend is smoked beer. I think one of the most sublime brews in the world is a good smoked porter. Smoked beer is also pretty easy to make and it finds few challengers in the average homebrew competition.

The key is to brew a killer porter. Make a base beer that's excellent in its own right, one that can support the smoke aroma and flavor. Then be careful not to ruin it with a heavy-handed smoke character. Smoked beers are more challenging to the palate and seem to be less universally appreciated by judges, but when done right they receive appropriate accolades.

What The Judges Look For

Knowing the criteria by which the judges evaluate your beer is pretty important. At a BJCP event (and virtually any other accredited competition), homebrew is judged in four basic sensory categories: sight, smell, taste and feel which are broken out into five different scoring areas on the scoresheet: aroma, appearance, flavor, mouthfeel and overall impression.

ONE: It all adds up to 50

The BJCP scores brews on a fifty-point scale. The scoring guide ranks beers like so:

World Class (45-50): "A world class beer with great character and no flaws."

Excellent (38-44): "Beers in this range have no flaws but may be missing the intangibles for that world class beer."

Very Good (30-37): "Beers in this range may have a minor (technical or stylistic) flaw, or may be lacking in balance or complexity."

Good (21-29): "A satisfactory beer that generally fits the style parameters."

Fair (14-20): "This beer has its share of problems that may include missing the style parameters, off flavors and aromas, balance problems, contamination or other major flaws."

Problem (0-13): "A beer with a major problem (usually contamination) that overwhelms all other flavors and aromas."

TWO: Looking for flaws

Homebrews are also rated on three scales of Stylistic Accuracy, Technical Merit and Intangibles. BJCP trained judges are proficient at spotting flaws in beer and, like police dogs sniffing for drugs at an airport, they are quick to hit on them. Judges are looking first for "clean" beer — meaning one without bacterial contamination and defects. Next they are looking for stylistic integrity, or adherence to style guidelines. Finally, beer judges love a beer

with real character; beers that tempt and tickle their taste buds. Nuances and complexity always account for higher scores.

The vast majority of beer judges I know and have had the pleasure of judging with are accomplished brewers who have a very good working knowledge of brewing procedure. They've also undergone the same testing procedures to become BJCP ranked beer judges, so their evaluation methodology is rarely in question. Despite this educational background, however, there are quite a few judges out there who lack familiarity with certain beer styles. A good part of this problem is due to the lack of good commercial examples of specific regional styles of beer, such as Kölsch, altbier, Vienna lager, Flanders brown ale, Belgian saison and faro lambic; a fact that can sometimes be exploited by savvy brewers.

THREE: Push the limits

In addition to brewing beer as close to style parameters as possible, I also suggest "brewing boldly", or pushing the upper limits of those parameters. Winning brews are typically those that are the most exciting or memorable — they stand out in a crowd of equals. After a long day of evaluating as many as two dozen different beers, and with palate fatigue setting in, subtlety is lost on many judges. Perhaps this is why most beers that win the best-of-show awards tend to be big, complex and alcoholic brews. Which reminds me of one infamous judge who brought with him to competitions two rubber stamps which read simply: MORE MALT and MORE HOPS!

Shipping Your Beer

How good your beer is matters little if it doesn't make it to competition in time and intact. Always pack your brews well and allow for sufficient delivery time whether the competition is across town or across the country.

ONE: Pack with care

The standard packing procedure suggests that you to wrap each individual bottle in newspaper — bubble wrap is even better. Place the bottles carefully in a properly sized box that has a bed of wadded newspaper or foam packing "peanuts." Be sure to line the box with a garbage bag or something similar (some brewers even double-box their entries for added protection). Fill in all voids and air spaces with wadded paper or packing peanuts and close and tie off the bag. Before closing and taping the box, be sure that all gaps have been filled in; loose bottles may not endure rough handling. Also be sure that all competition paperwork has been filled out and included in the box (outside the bag) before sealing.

TWO: Don't break the law

It's helpful to know ahead of time how you'll be shipping your beer. It's against the law to ship alcoholic beverages through the United States postal system so don't even try. Private carriers such as UPS and Federal Express will ship your brews, but they have the right to refuse to ship your box if it's not properly packed and labeled. Honesty is said to be the best policy, but it may also keep your brews grounded. Because of this possibility, it's important to be as vague as possible about the contents of your shipment. Divulge only what you must. When filling out the shipper's paperwork, describe the contents of your package as "liquid for analysis only" or something to that effect. My favorite was "live yeast cultures" — and it worked every time.

Two Final Notes

ONE: It's the luck of the draw

It doesn't take a genius to realize that there are a couple of givens when it comes to homebrew competitions. The first one — how well you do in competition — is only partly dependent on how good your beer is. If you submit a respectable beer in a category that is poorly represented, you stand a good chance of winning. On the other hand, if you submit a very good beer in a popular category, odds are that someone else may have submitted something better. In other words, a beer scoring a 36 in one competition might win a first place award while that same beer with the same score on the same day at a different competition may not place at all. It's the luck of the draw.

TWO: Don't get discouraged

The second given is that homebrew competitions are an imperfect science. As long as human beings are in a position to evaluate and score beer, there will be inevitable discrepancies and errors. Human beings are not automatons, their sensory evaluation skills are not constant or consistent. Thresholds for taste and smell may vary from day to day and morning to afternoon. Throw in variables such as the judges' ability and experience, their health and mood, the ambient sound, temperature and lighting in the room where the judging is being done, and you've got a bouillabaisse of distractions that can lead to inconsistent evaluation. The only consolation is the fact that your competitors' brews were getting the same treatment.

I think everyone who regularly competes in homebrew competitions has a horror story to tell about a bad judge or a bad score. And when it happens to you, don't sweat it. It's inevitable that some anonymous beer judge somewhere is not going to agree with your lofty appraisal of your own beer. These things happen. Don't let it discourage you — continue sending your brews to competitions, and, regardless of how many awards you do or don't win, use the judge commentary and feedback as the constructive tool for better brewing that it was always meant to be. ■

Marty Nachel has been brewing his own beer and competing since 1985 and became one of the first 70 certified beer judges in North America the following year.

Marty went on to write "Beer for Dummies" and "Homebrewing for Dummies" (IDG Books Worldwide) and he finally opened up his own homebrew shop in 2000. He is a frequent contributor to Brew Your Own. His most recent feature was "Beer Made Easy" in the May-June 2002 issue.

the HEAVY MEDAL man

by **Ed Measom**

ten more ways to earn points and win awards

WINNING shouldn't be the only reason you enter a homebrew competition. But if you're going to enter anyway, why not making winning one of your goals ... along with getting valuable feedback, supporting a homebrew club and having fun? I've entered lots of competitions and brought home my share of awards. I've also improved my brewing skills and become a better judge. Here are some tips to get you started.

TIP ONE: enter!

As the old saying goes, you can't win if you don't enter. Over the years I've heard a lot of excuses for not entering. "I know my beer is good. So why should I enter?" "I never win." "I only keg my beer." And so on.

There are many reasons for entering besides winning. I participate in several competitions just to support the club. Even if your beer is mediocre, entering is a good way to get feedback and improve your techniques.

I agree that counter-pressure bottle filling is demanding. One tip is to transfer directly from keg to bottle using a tube that fits into the end of a picnic tap and is the same length as the bottle. This procedure needs to be done over the sink, because the bottle will overflow with foam before it is full. The beer will also lose some carbonation, but not much, and this technique sure beats counter-pressure filling.

I brew in six-gallon batches. Then I keg half of each batch in a three-gallon keg and bottle the rest. This works great, because I always have bottles on hand to send to competitions.

TIP TWO: take notes

Detailed notes can be very helpful when developing new recipes or trying to nail a style. I used to hand-write the recipe and keep notes as I brewed the batch. I kept the notes in a three-ring binder, and when I got completed score sheets back from competitions, I put them in the binder with the recipe and my brewing notes.

The notes and score sheets are invaluable the next time you brew a recipe. I'm always trying to improve, since I've yet to achieve a perfect 50-point score. Nowadays, I keep my notes in ProMash software.

TIP THREE: choose the best style

One lesson I learned the hard way is that what you try to brew is not always what you end up with. For new brewers, this can be a hard lesson. In fact, the notion is counterintuitive. "The recipe said American pale ale. I followed the directions and watched the temperatures and ..." This may be so, but the resulting beer may still be too dark for style or lack the proper hop punch for an APA. This beer may score better as American amber or something completely different.

I set aside four bottles for each competition. Just before entering, I invite a qualified judge or two to my house and we taste the contents of the fourth bottle. I know what I was shooting for, but the other judges don't. We talk it over and choose the best style. Sometimes the results are surprising.

You may also have a beer that fits more than one category. Enter it in both. I know one brewer who developed a beer that fit all three subcategories of American lager.

Speaking of choosing a style, you might want to pay attention to the less popular styles. Not only will the numbers favor you, but also you may discover some interesting nuances in a more obscure type of beer.

When brewing for competitions, go a bit heavy when possible. For example, shoot for the high end of the hop bitterness when making an American pale ale. Do likewise with gravity for any of the high-alcohol beers. Similarly, when entering a beer that is close to the low end of a style, enter the next-lowest style.

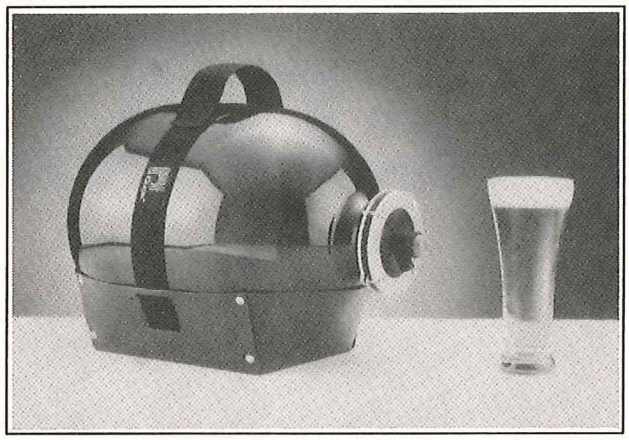
TIP FOUR: set aside entries

At the time of bottling, I set aside entries for my own club's competition as well as the three other events in our circuit (the Gulf Coast), the AHA nationals and several local competitions. I set up a case box for each of these competitions and put four bottles of each batch in the case.

Of course some beers are best if fresh. Conversely, some beers are better after aging. The lighter ones are only put aside for competitions in the next month or two. The bigger the beer, the longer I'll save them. Don't forget to taste a bottle before entering.

TIP FIVE: brew early and often

Of course, you first need to brew in order to have entries. And the more you brew, the better you'll get. So my suggestion is to brew a lot. Then you'll always have entries and plenty of beer for meetings, parties and friends.



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Make the brewing session as fun as possible. I brew outside, next to the house, and I set up stereo speakers so I can listen to tunes. Longtime club members are always invited to join me, and I call new members or those who've expressed an interest in a particular style or technique. Every time I brew with someone else, whether it's a novice or experienced brewer, I've learned something.

TIP SIX: all-grain or not

In my club, the all-grainers used to look down on the extract guys. This ended after one competition in which the extract-and-grain brewers kicked the all-grainers' butts.

That said, I still brew all-grain for competitions. First, I like to control the mashing process. Second, I can create a lighter beer when I use grain. Third, I think all-grain techniques help brewers better understand the process.

TIP SEVEN: do your homework

Read everything you can get your hands on about homebrewing. There are lots of great books, magazines and Internet forums.

Join a homebrew club. This is a great source of ideas and feedback. Go to the meetings and bring samples.

If you get the chance, travel. When traveling in the United States, I always do some beer hunting. The local homebrew shop is a great source of information on local brewpubs and beer. And if you ever get the chance to visit any of the world's great brewing regions, do it! This is by far the best way to taste classic styles.

TIP EIGHT: become a judge

Enroll in the Beer Judge Certification Program (BJCP). There are some really good brewers and judges that are not BJCP, but all BJCP judges have a set of qualifications that will help in brewing, including having the discipline to learn the various styles and judging techniques.

The best way to get started is by being a competition steward. Then progress to judging when you're ready. But whatever you do, go to competitions and participate.

TIP NINE: constant temps

I'm not going to go into a lot of brewing technique. But I do want to stress one point: Keep a constant temperature during fermentation. Much is written about the ideal temperature, but not the negative impact of variable temperatures. Yeast likes a stable environment and produces better beer when the temperature is consistent.

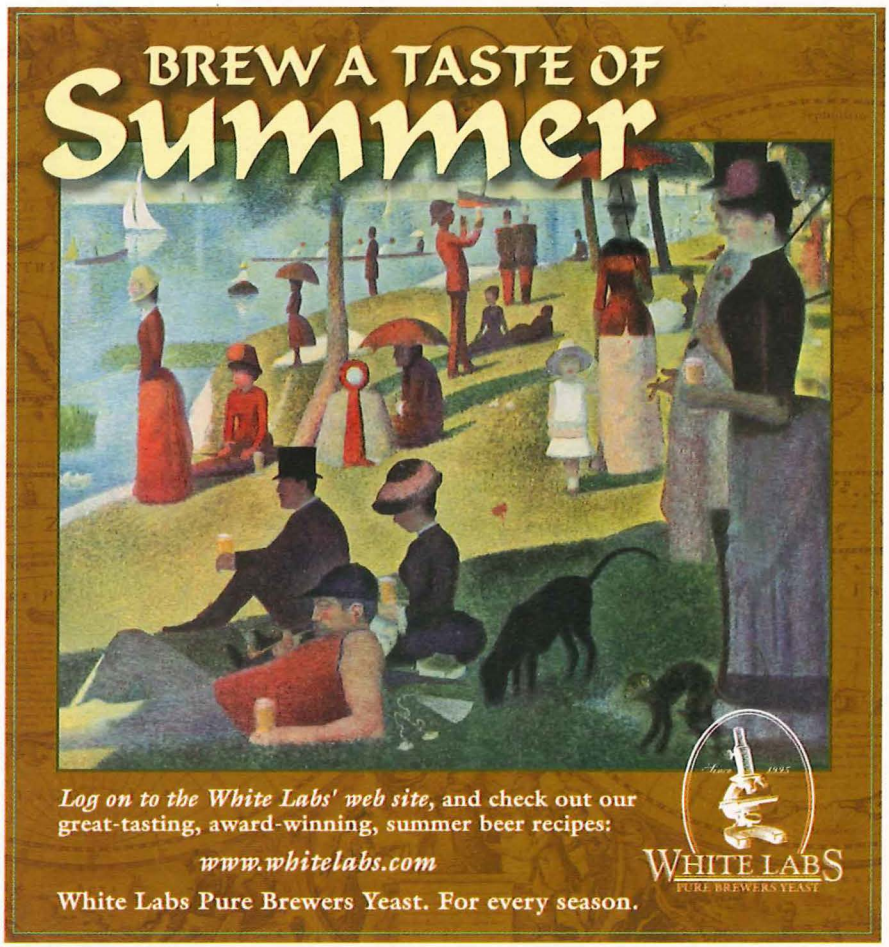
Since I live in a warm climate and ferment ales outdoors (lagers are strictly in the fridge), my struggle for 11 months of the year is to keep the beer cool. I place the carboy in a water bath formed by a cooler and a self-constructed lid made of Styrofoam and duct tape. The water is circulated with an aquarium pump through copper tubing that has been placed in a dorm refrigerator. A temperature controller triggers the pump.

TIP TEN: have fun!

Think of ways to make entering competitions more enjoyable. For example, give your beer a lighthearted name. These are usually read by the emcee and everybody gets a kick out of the funny ones. My club organizes our shipments to other competitions. We call this a packing party and the name is appropriate.

Don't take homebrew competitions too seriously. After all, it's just beer and this is supposed to be a hobby. Competitions are a bit of a crapshoot, anyway. I've had the same beer score 20 points different from one competition to another. This is due to any number of factors, including the ability of the judges, how the beer was handled at the competition, shipping degradation, the other beers in the flight and more. The best way to overcome these factors is to brew good beer, have multiple entries and not take the results (good or bad) personally. As we say in my club: "Drink Better Beer."■

Ed Measom is president of the Central Florida Home Brewers in Orlando. He is a nationally ranked BJCP judge and has won more than 100 ribbons and medals in homebrew competitions throughout the Southeast. He can be contacted at www.cfhb.org.

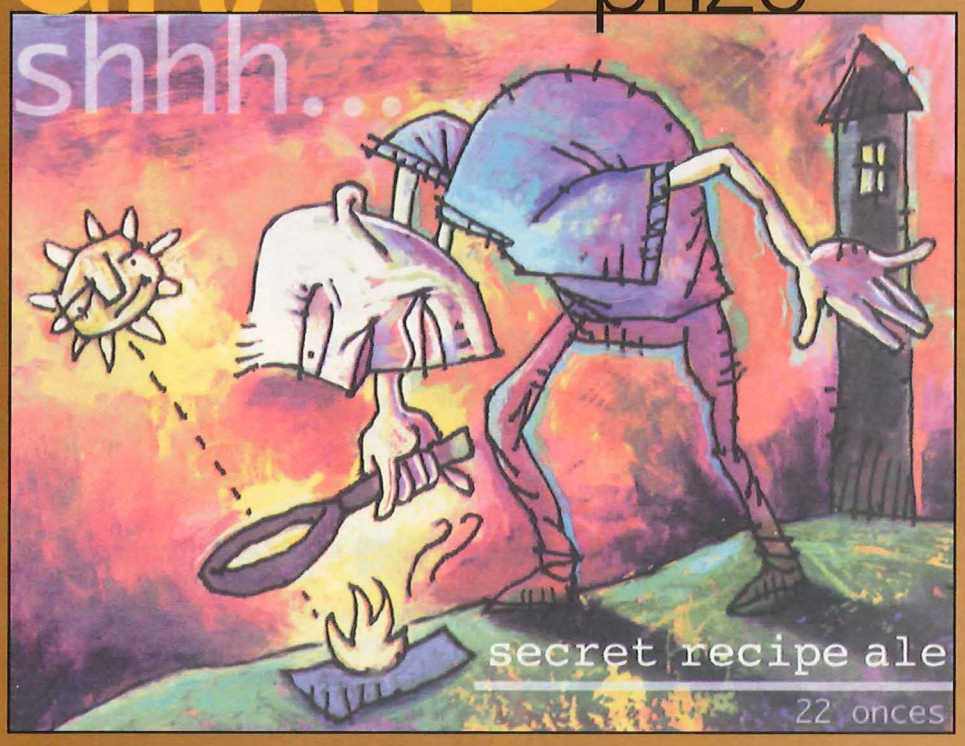


2003 LABEL contest

The eighth annual *Brew Your Own* label contest offered a fascinating glimpse inside the minds of our readers. And boy, are you twisted. In fact, if you take these winning labels as a sort of mass Rorshach test of the worldwide homebrew community, you'd have to conclude we're in urgent need of some serious group therapy. Our psychological profile includes an obsession with beer-swilling animals and insects, delusions of homebrew grandeur, frequent references to space aliens, and disturbingly close-up depictions of beer guts and hairy butts. And I won't even get into the sex stuff here.

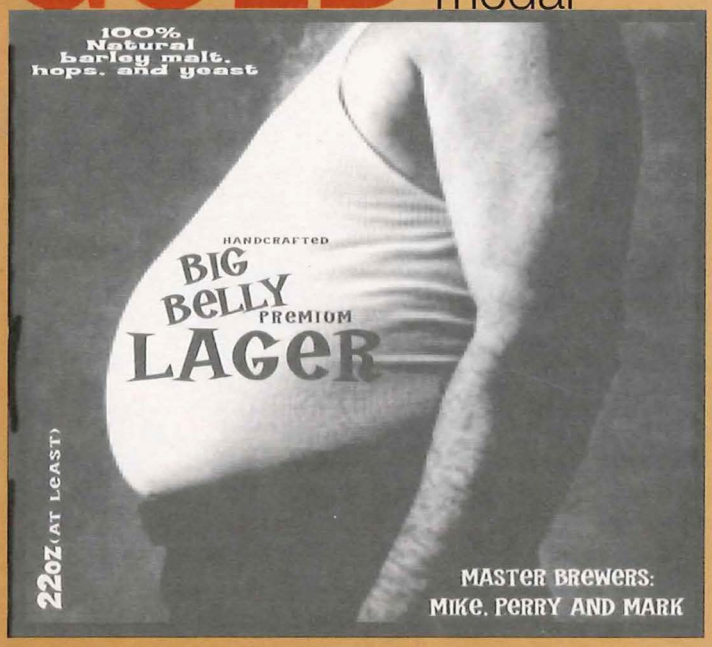
Like I said, you're all twisted. You're also lots of fun. So three cheers to the freaky people. Enjoy your fame and prizes, brew great beer and see you next year. — The Editor

GRAND prize



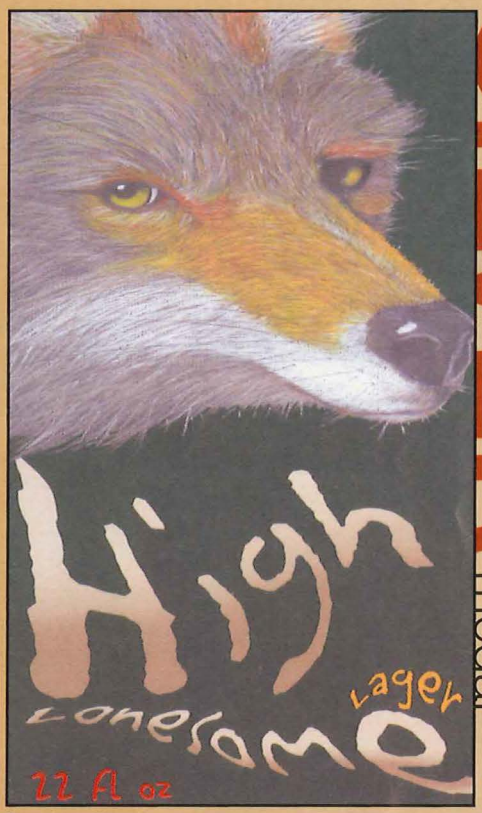
Barry Fitzgerald
Lawrence, Kansas
Prize: Complete Cornelius kegging system from Midwest Homebrewing Supplies; gift certificate from Hop Tech; five coupons for yeast from White Labs, Inc.

GOLD medal



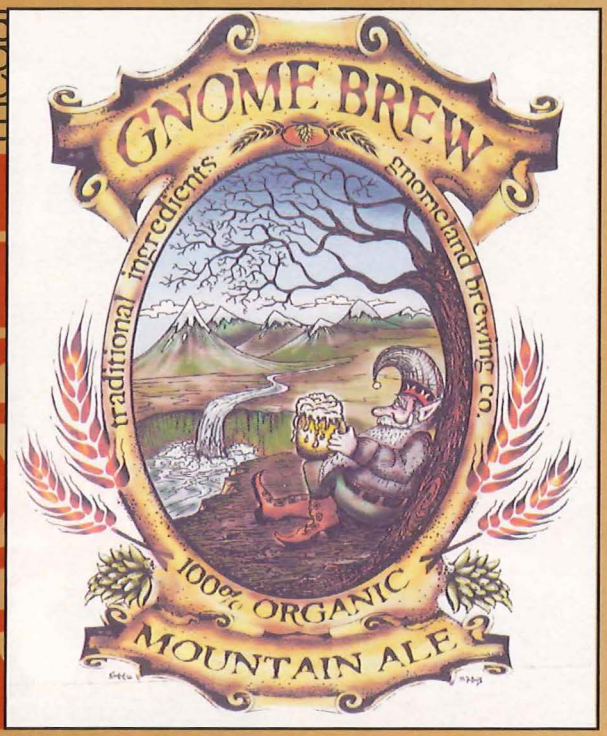
Matt Kohout
Minneapolis, Minnesota
Prize: Double burner outdoor cooker from Camp Chef; bench bottle capper from Homebrew Shop (IL); five coupons for yeast from White Labs, Inc.

SILVER medal



Lucas Rate
Edmonds, Washington
Prize: Gift certificate from Leener's Brew Works; five coupons for yeast from White Labs, Inc.

BRONZE medal

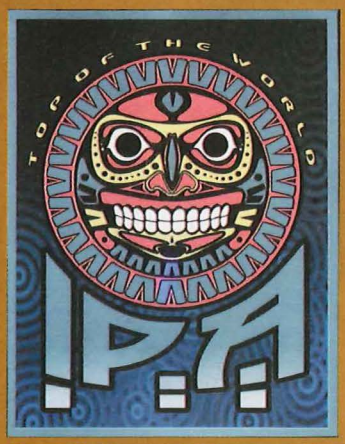


Michael DuBois
Woodstock, New York
Prize: Single burner outdoor cooker from Camp Chef; five coupons for yeast from White Labs, Inc.

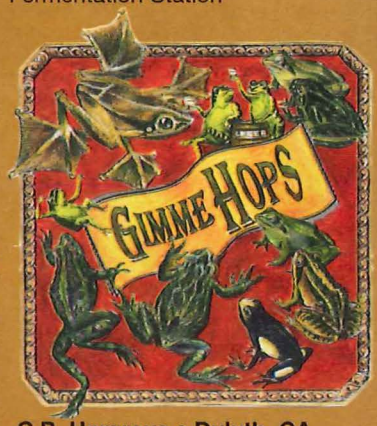
HONORABLE mention

Bradley Meehan • Lee's Summit, MO
Prize: Gift certificate from Assembly Required

Chris Gillis • Somerville, MA
Prize: Gift certificate and 6-month membership in the Winnipesaukee Area Brew Crew from The Fermentation Station



Dave Oaks • Anchorage, AK
Prize: Two-year gold membership from BeerTools.com

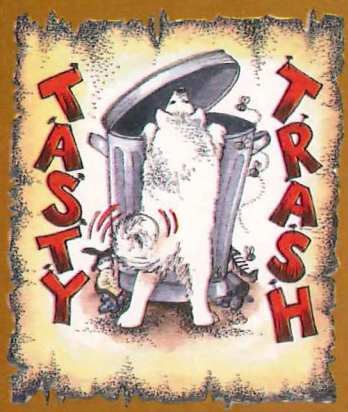


C.B. Hargrove • Duluth, GA
Prize: Gift certificate from Homebrewers Outpost & Mail Order Co.

Frank Edwards
Rochester, NY
Prize: Black Runner tap handle from Tap Handles, Inc.

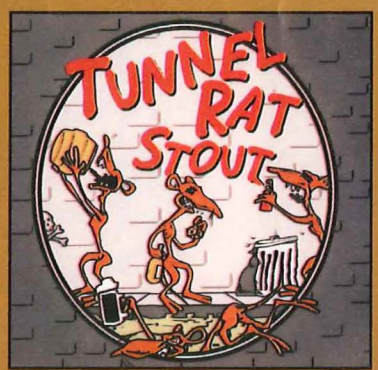
Chad Gertken • St. Stephen, MN
Prize: 50-pound bag of two-row brewer's malt from Briess Malting Co.

Scott Neff • Minneapolis, MN
Prize: Polo shirt from White Labs, Inc.



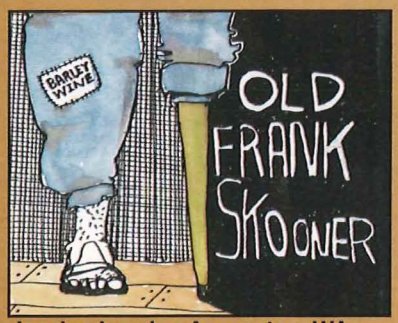
Glen Fehnel • Lancaster, PA
Prize: 90-bottle rotating drainer tree from The Pumphouse

Jay Winkler • Columbia, MO
Prize: Party Pig set-up package from Quoin Industrial

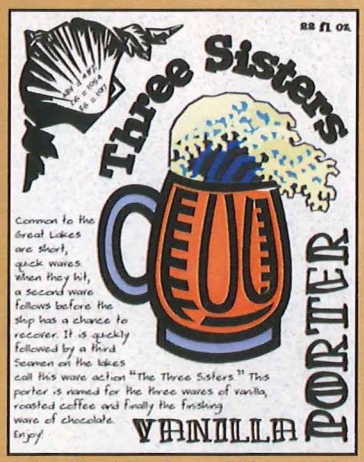


David Levesque • Forestville, CT
Prize: Gift certificate from Maltose Express

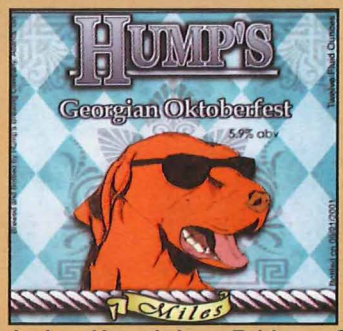
HONORABLE mention



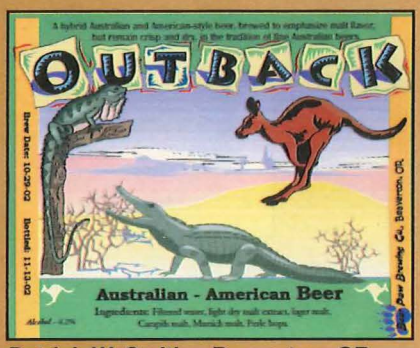
Jessica Lynch • Anacortes, WA
Prize: Alcobase kit, carbon filter system and Still Spirits Flavors from Steinbart Wholesale



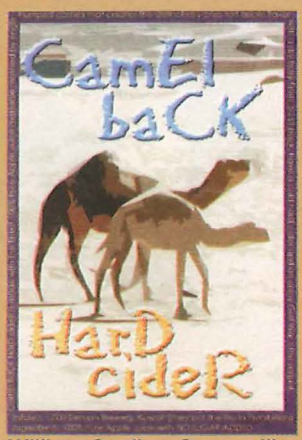
John Wyzkiewicz • Chicago, IL
Prize: Black Runner tap handle from Taphandles, Inc.



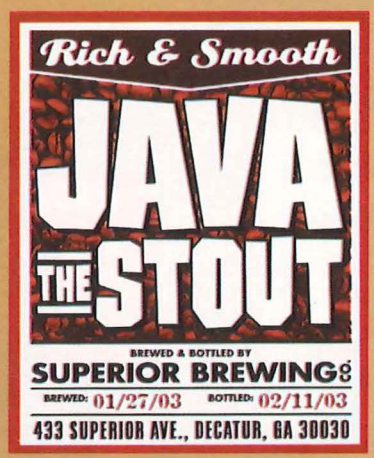
Joshua Humphries • Fairburn, GA
Prize: Messenger bag from White Labs, Inc.



Patrick W. Smith • Beaverton, OR
Prize: Tap-a-Draft beverage dispensing system from Morning Glory Fermentation Supply

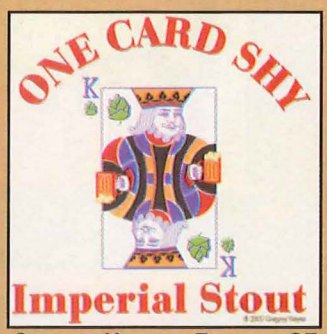


William Scully • Somerville, MA
Prize: Fleece jacket from Muntons p.l.c.



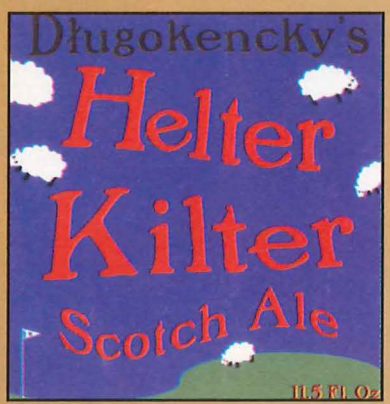
Rick Brozek • Decatur, GA
Prize: 50-pound pail of Straight-A Cleanser from Logic, Inc.

Tim Werth • Waterford, MI
Prize: Brew pot thermometer from BrewCitySupplies.com



Gregory Hayes • Eugene, OR
Prize: Gift certificate, hat and T-shirt from O'Shea Brewing Co.

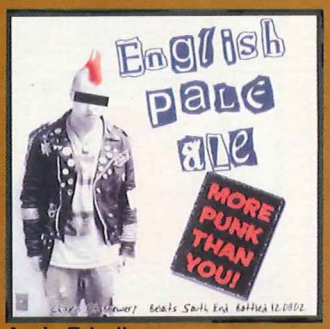
Scott Nichols • Union Grove, WI
Prize: Gift certificate from Grape and Granary



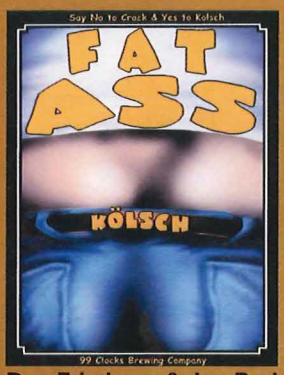
Paul Dlugokencky • Centerport, NY
Prize: Fleece jacket from Muntons p.l.c.

Walter Keener • Huntsville, AL
Prize: Tap-a-Draft beverage dispensing system from Austin Homebrew Supply

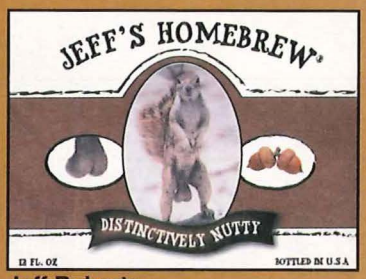
EDITOR'S choice



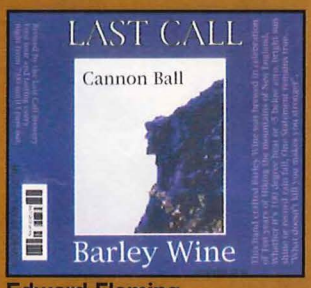
Andy Friedl
Beloit, WI



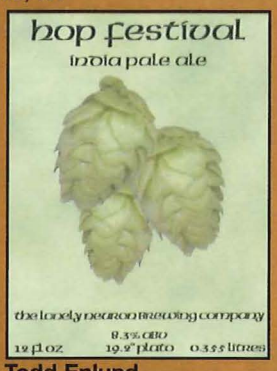
Dan Friedman & Jan Porinchak
Melville, NY



Jeff Roberts
Boyceville, WI

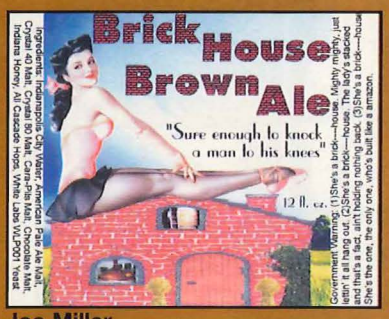


Edward Fleming
West Warwick, RI

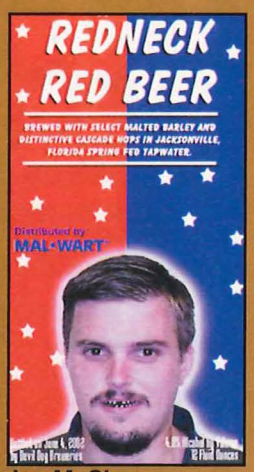


Todd Enlund
Gresham, OR

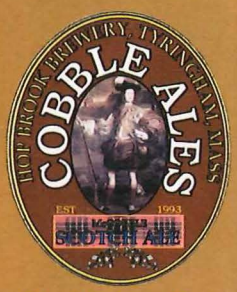
Gregory James
Highland, MI



Joe Miller
Raleigh, NC

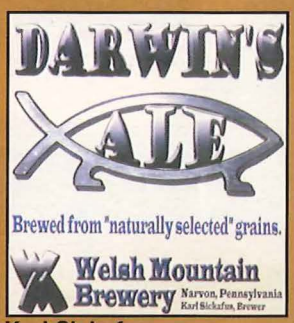


Jon McClow
Jacksonville, FL

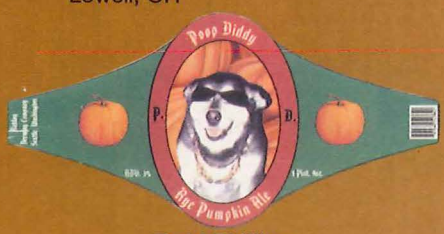


Geoff Ashworth
Tyringham, MA

Douglas Stetson
Lowell, OH



Karl Sickafus
Narvon, PA

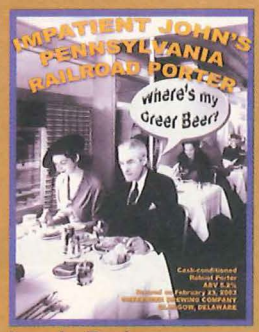


Todd Phillips
Seattle, WA

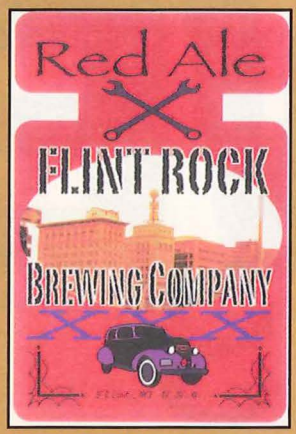
Ken Byers
Felton, CA

Travis Savchenko
Garrison, IA

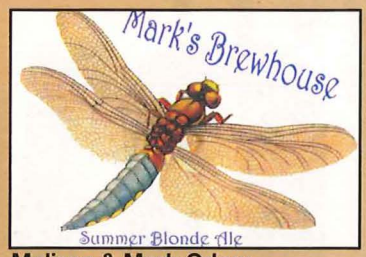
EDITOR'S choice



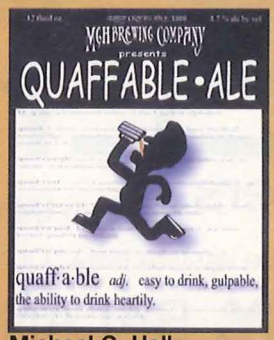
Laszlo Bodo
Middletown, DE



Mark Hawkins & Carl Spaniola
Flint, MI

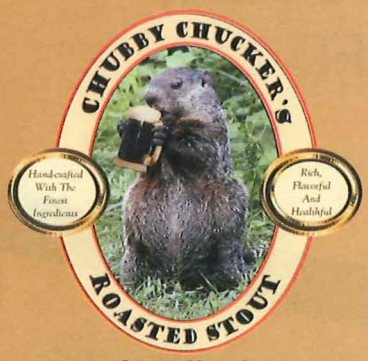


Melissa & Mark Odom
Fordland, MO

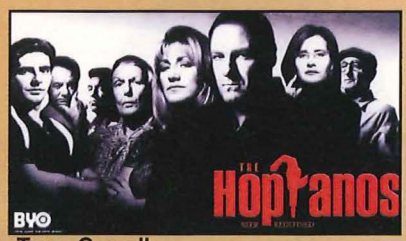


Michael G. Hall
Arvada, CO

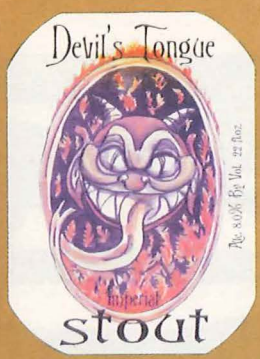
Mark McDermott
Park Forest, IL



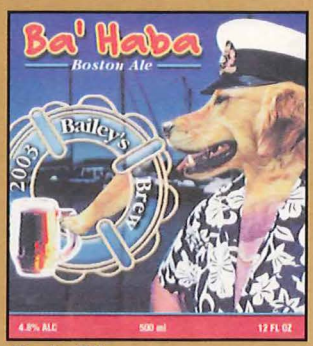
Steve Haack
Lincoln, NE



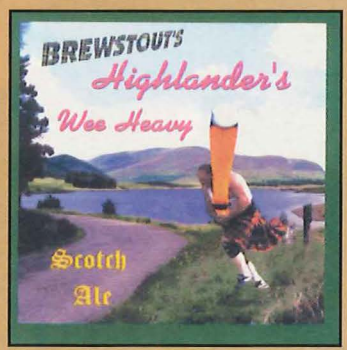
Terry Carroll
Grain Valley, MO



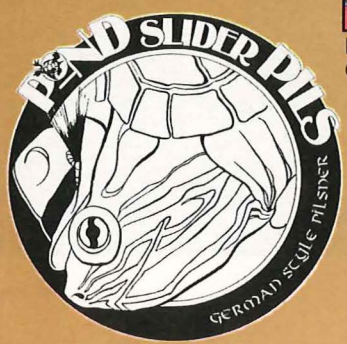
Miles Franklin
Denver, CO



Nayla Slim
Gillette, NJ



Peggy Brewster
Springfield, VT



Terry Morin
Vancouver, WA

Phil Harvey
Gurnee, IL

lawn MOWER BEERS

by **Joe and Dennis Fisher**

Our **summer beers** are both **thirst-quenching** and **flavorful.** Plus, they are easy to brew. Our instructions tell you how to make **LIGHT, DRY,** BALANCED beers that finish **CLEAN.**

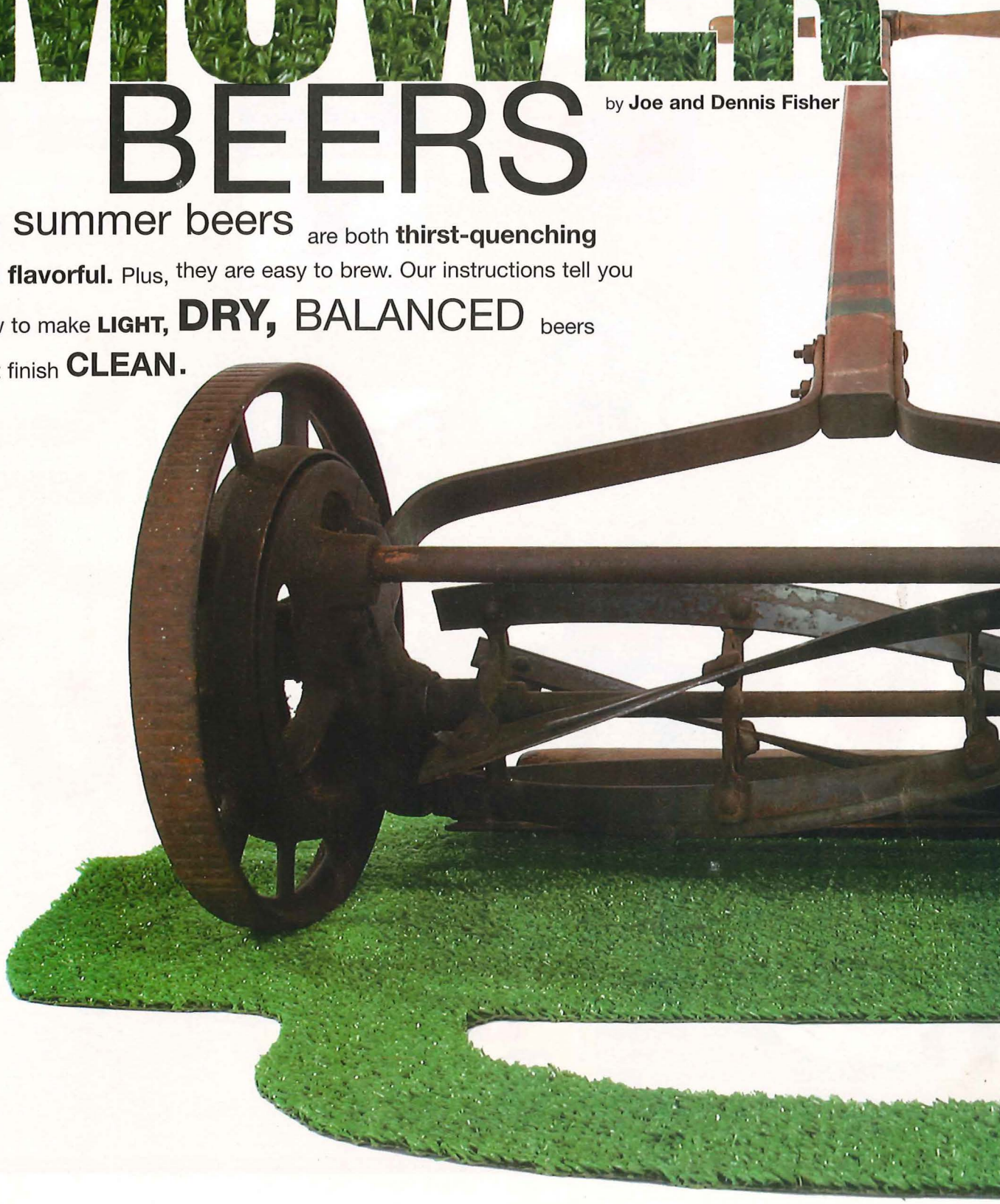


PHOTO BY CHARLES A. PARKER/IMAGES PLUS

It's summer and North Americans everywhere are reaching for their lawnmowers, weed whackers and lawn edgers. We personally own five pieces of power equipment dedicated to the sole purpose of keeping our grass no more than two inches high. When all that sweaty work is done, when the lawn has been shorn to a perfect flat-top and every dandelion neatly decapitated, it is natural to want to sit down and have a beer. After all, you've lost a lot of fluid in the noble pursuit of the ideal lawn and you need to replace it.

Unfortunately, the term "lawnmower beer" has come to describe only pale, fizzy "Pilsners," as if the only thing you can grab after a hot day in the back forty is a bottle of Old Schwill. Of course, under the right conditions — like when swarms of mosquitoes are bleeding you dry and you still haven't trimmed under the lilacs — a can of pale yellow brewski can taste like ambrosia. However, as homebrewers we know there are a lot of beer styles that will clean the dust and little bits of grass out of your filter just as well, plus have great beer flavor. These beers should be light enough so chugging one won't knock you off your pins, but flavorful enough so that you can say to yourself, "That was a good beer" instead of "Buuuuuuurp." Any homebrewed lawnmower beer should embody all of these qualities with flavor to spare.

Here are some recipes that will make balanced, drinkable versions of various beer styles. These beers will be as welcome at your family picnic as they are at your homebrew club meeting. In these recipes, LME refers to liquid malt extract while DME refers to dried malt extract.

The extract recipes presented here were formulated specifically for the procedures listed below. In order to make the best possible lawnmower beer — one that exhibits the right color, body and bitterness — follow the instructions exactly. In order to do this, you'll need a brewpot that holds at least 5 gallons. You wouldn't try to mow your whole lawn with a weed whacker, would you? Well, when brewing these beers, you'll also need the right tool for the job. Likewise, some of the procedures might contain steps you are not used to (or even contradict ideas about brewing you may hold). Follow the instructions anyway; you'll be glad you did. We'll try to point out the "whys" of steps when possible.

The three key steps to pay attention to are wort cooling, amount of yeast pitched and fermentation temperature. Make sure the wort is cooled all the way down to fermentation temperature before pitching the yeast. Don't be afraid to leave your brewpot in the sink while you watch the Home and Garden Channel for an hour or so. That's far preferable to rushing this step and pitching your yeast into hot wort. Also, make a yeast starter. Boiling one cup of DME in 64 oz. (1.9 L) of water for 15 minutes will make enough starter wort for an ale. You'll need twice as much for a lager. This may seem like a pain, but it is the single most important step for these beers. (For more on yeast starters, see the March-April 2002 issue of BYO.)

Finally, keep your wort at the correct temperature throughout the fermentation. If your carboy is in an air-conditioned room, draping a wet T-shirt over it should be sufficient for ales. If not, make a cold water bath from a picnic cooler or (clean) trash can and set your carboy in it. You can use ice to regulate the temperature.

Finally, the Lawnmower Council of America urges you to drink responsibly. It's much better to use the ice in your cooler to keep beer cold rather than to transport your fingers to the emergency room.

Weed Whacker Wheat

(5 gallons, extract only)

OG = 1.048 FG = 1.013

IBUs = 14 ABV = 4.5%

A cool, refreshing wheat beer. You can alter the wheat yeast characteristics by fermenting at the low or high end of the specified temperature range.

Ingredients

3.75 lbs. (1.5 kg) Weyermann Wheat LME

2.25 lbs. (1 kg) Muntons Light DME

4 AAUs Tettnanger hops (bittering) (1 oz./28 g of 4% alpha acid)

White Labs WLP300 (Hefeweizen) or Wyeast 3068 (Weihenstephan Weizen) yeast

1.1 cups corn sugar (for priming)

Step by step

Bring 4 gallons (15 L) of water to a boil. Remove brewpot from heat and add malt extracts. Stir thoroughly to dissolve extracts completely. Return to a boil and add hops. Boil for 45 minutes. When done boiling, put a lid on the brewpot and cool in your sink (or bathtub). Change cooling water every five minutes until brewpot is cool enough to touch, then add ice to cooling water. Chill the wort to 72 °F (22 °C) then siphon to a fermenter. Shake bucket or carboy to aerate wort, then add cold water to make 5 gallons (19 L). Pitch yeast. (You will need the yeast from a 64 oz. (1.9 L) starter. Alternately, you can use two pitchable smack packs, vials or tubes of yeast.) Ferment at 68–72 °F (20–22 °C). Temperatures on the high end of the range will yield more "wheat beer" aromatics. Bottle when fermentation stops. Be sure to stir in corn sugar well. (And no, that's not too much corn sugar — wheat beers are highly carbonated). Bottle condition at room temperature for 3 weeks then refrigerate for 1 week.

Partial Mash Option:

Replace malt extracts with 3.75 lbs. (1.7 kg) Weyermann Wheat LME, 2.0 lbs. (0.91 kg) 2-row Pilsner malt and 2.0 lbs (0.91 kg) wheat malt. Perform a partial mash by steeping the crushed grains in 1.25 gallons (4.7 L) of water at 150 °F (66 °C) for 45 minutes. Following mash, rinse grain bag with 1.25 gallons (4.7 L) of water at 165 °F (74 °C). Add 1.5 (5.7 L) gallons of water and heat this 4 gallons (15 L) of wort to a boil and add malt extract. Then, follow the extract instructions to complete the brewing.

Red Dawn American Wheat

(5 gallons, extract with grains)

OG = 1.045 FG = 1.012

IBUs = 16 ABV = 4.3%

Many American wheat beers are bland and insipid. This recipe spices things up with little extra color and flavor from crystal malt. Still, the focus is on balance and drinkability.

Ingredients

4 lbs. (1.8 kg) Alexander's Wheat LME

1.5 lbs. (0.57 kg) Briess Light DME

0.5 lbs. (0.23 kg) crystal malt (30 °L)

4 AAUs Tettnanger hops (bittering) (1 oz./28 g of 4% alpha acid)

2 AAU Tettnager hops (flavor) (0.5 oz./14 g of 4% alpha acid)

White Labs WLP001 (California Ale) or Wyeast 1056 (American Ale) yeast

1 cup corn sugar (for priming)

Step by step

Place crushed crystal malt in a steeping bag. Bring 2 gallons (7.6 L) of water to 168 °F (76 °C). Steep grains for 30 minutes. Add 2 gallons (7.6 L) of water to grain "tea" and bring this 4 gallons (15 L) of liquid to a boil. Remove brewpot from heat and add malt extracts. Stir thoroughly to dissolve extracts completely. Return to a boil and add hops. Boil for 45 minutes. Add flavor hops with 15 minutes left in boil. When done boiling, put a lid on the brewpot and cool in your sink. Change cooling water every five minutes until brewpot is cool enough to touch, then add ice to cooling water. Chill the wort to 72 °F (22 °C) then siphon to fermenter. Shake bucket or carboy to aerate wort, then add cold water to make 5 gallons (19 L). Pitch yeast. (You will need the yeast from a 64 oz. (1.9 L) starter or 1 cup of yeast sediment. Alternately, you can use two pitchable packs, tubes or vials of yeast). Ferment at 68–72 °F (20–22 °C). Bottle when fermentation stops. Be sure to stir corn sugar well into beer. Bottle condition at room temperature for 2 weeks then refrigerate for 1 week before drinking.

Partial Mash Option:

Replace malt extracts and grains with 3.5 lbs. (1.6 kg) Alexander's Wheat LME, 2 lbs. (0.9 kg) 6-row brewers malt, 1.5 lbs. (0.7 kg) wheat malt and 0.5 lbs. (0.2 kg) crystal malt (30 °L). Perform a partial mash by steeping the crushed grains in 1.25 gallons (4.7 L) of water at 150 °F (66 °C) for 45 minutes. Following mash, rinse grain bag with 1.25 gallons (4.7 L) of water at 165 °F (74 °C). Add 1.5 gallons (5.7 L) of water and heat this 4 gallons (15 L) of wort to a boil and add malt extract. Then, follow the extract instructions to complete the brewing.

I Fought the Lawn (and the Lawn Won) Ordinary Bitter

(5 gallons, extract with grains)

OG = 1.038 FG = 1.010

IBUs = 30 ABV= 3.6%

This beer's name is bitter and so is the song, yet this is a true session beer. It's caramel maltiness is balanced by a firm — but not overpowering — hop bitterness.

Ingredients

4.0 lbs. (1.9 kg) Munton's Amber DME

0.25 lbs. (0.11 kg) British crystal malt (40 °L)

0.25 lbs. (0.11 kg) British crystal malt (60 °L)
4 AAUs East Kent Goldings hops (bittering)
(0.67 oz./19 g of 6% alpha acid)
2.4 AAUs Fuggles hops (bittering)
(0.6 oz./17 g of 4% alpha acid)
3 AAUs East Kent Goldings hops (flavor)
(0.5 oz./14 g of 6% alpha acid)
2 AAUs Fuggles hops (flavor)
(0.5 oz./14 g of 4% alpha acid)
0.25 oz. (7 g) Fuggles leaf hops (aroma)
Wyeast 1968 (London ESB) or White Labs WLP002 (English Ale) yeast
2/3 cup corn sugar (for priming)

Step by step

Place crushed crystal malts in a steeping bag. Bring 2 gallons (7.6 L) of water to 168 °F (76 °C). Steep grains for 30 minutes. Add 2 gallons (7.6 L) of water to grain "tea" and bring 4 gallons (15 L) of water to a boil. Remove brewpot from heat and add malt extracts. Stir thoroughly to dissolve extracts completely. Return to a boil and add bittering hops.

Boil for 45 minutes. Add flavor hops with 15 minutes left in boil. Add aroma hops at the end of the boil. When done boiling, put a lid on the brewpot and cool in your sink. Change cooling water every five minutes until brewpot is cool enough to touch, then add ice to cooling water. Chill the wort to 72 °F (22 °C) then siphon to fermenter. Shake bucket or carboy to aerate wort, then add cold water to make 5 gallons (19 L).

Pitch yeast. (You will need the yeast from a 64 oz. (1.9 L) starter or 1 cup of yeast sediment. Alternately, you can use two pitchable packs, tubes or vials of yeast.) Ferment at 68–72 °F (20–22 °C). Bottle when fermentation stops. Be sure to stir corn sugar well into beer. Bottle condition at room temperature for 2 weeks then refrigerate for 1 week before serving.

Partial Mash Option:

Replace malt extracts and specialty grains with 2.15 lbs. (0.98 kg) Munton's Amber DME, 3.5 lbs. (1.6 kg) English pale ale malt, 0.25 lbs. (0.1 kg) crystal malt (40 °L) and 0.25 lbs. (0.1 kg) crystal malt (60 °L). Perform a partial mash by steeping the crushed grains in 1.25 gallons (4.7 L) of water at 150 °F (66 °C) for 45 minutes. Following mash, rinse grain bag with 1.25 gallons (4.7 L) of water at 165 °F (74 °C). Add 1.5 gallons (5.7) of water and heat this 4 gallons (15 L) of wort to a boil and add malt extract. Then, follow the extract instructions to complete the brewing with one exception: add 1/2 tsp. Irish moss for final 15 minutes of boil.

Homelite Kölsch

(5 gallons, extract only)

OG = 1.043 FG = 1.011
IBUs = 25 ABV = 4.2%

Lightly malty. Lightly hoppy. Hugely thirst-quenching. Pour a big mug of this after trimming the hedge.

Ingredients

4.66 lbs. (2.1 kg) Bierkeller Light LME
1 lbs. (0.45 kg) Coopers Extra Light DME
6.75 AAUs Northern Brewer hops (bittering)
(0.75 oz./21 g of 9% alpha acids)
0.66 oz. (19 g) Tettnanger leaf hops (aroma)
Wyeast 2565 (Kölsch) or White Labs WLP029 (German Ale/Kölsch) yeast
3/4 cup corn sugar (for priming)

Step by step

Bring 4 gallons (15 L) of water to a boil. Remove brewpot from heat and add malt extracts. Stir thoroughly to dissolve extracts completely. Return to a boil and add bittering hops. Boil for 45 minutes. When done boiling, add aroma hops then immediately put a lid on the brewpot and cool the wort in your sink. Change cooling water every five minutes until brewpot is cool enough to touch, then add ice to cooling water. Chill the wort to 72 °F (22 °C) then siphon to fermenter. Shake bucket or carboy to aerate wort, then add cold water to make 5 gallons (19 L). Pitch yeast. (You will need the yeast from a 64 oz. (1.9 L) starter or 1 cup of yeast sediment. Alternately, you can use two pitchable packs, tubes or vials of yeast.) Ferment at 65–68 °F (18–20 °C). Bottle when fermentation stops. Be sure to stir in corn sugar well. Bottle condition at room temperature for 2 weeks then refrigerate for 2 weeks.

Partial Mash Option:

Replace malt extracts with 3.25 lbs. (1.5 kg) Bierkeller Light LME and 4 lbs. (1.8 kg) 2-row Pilsner malt. Perform a partial mash by steeping the crushed grains in 1.25 gallons (4.7 L) of water at 150 °F (66 °C) for 45 minutes. Following mash, rinse grain bag with 1.25 gallons (4.7 L) of water at 165 °F (74 °C). Add 1.5 gallons (5.7 L) of water and heat this 4 gallons (15 L) of wort to a boil and add malt extract. Then, follow the extract instructions.

Craftsman Cream Ale

(5 gallons, extract only)

OG 1.052 FG 1.014
IBU 16 ABV 4.9%

A dry, well-balanced beer inspired by Canadian cream ales.

Ingredients

4 lbs. (1.8 kg) Ironmaster Canadian Ale kit
1.5 lbs. (0.68 kg) Alexander's Light DME
1.0 lbs. (0.45 kg) corn sugar
4.5 AAU Willamette hops (bittering)
(1 oz./28 g at 4.5% alpha acids)
1/2 tsp. Irish moss
1/2 tsp. yeast nutrient
Wyeast 1272 (American Ale II) or White Labs WLP051 (California Ale V) yeast
7/8 cup corn sugar (for priming)

Step by step

Bring 4 gallons (15 L) of water to a boil. Remove brewpot from heat and add malt extracts and corn sugar. (No, the corn sugar won't make the beer "cidery." Don't replace this with malt extract.) Stir thoroughly to dissolve extracts and sugar completely. Return to a boil and add the bittering hops. Boil for 45 minutes. Add Irish moss and yeast nutrient during last 15 minutes of the boil.

When done boiling, put a lid on the brewpot and cool in your sink (or bathtub). Change cooling water every five minutes until brewpot is cool enough to touch, then add ice to cooling water. Chill the wort to 72 °F (22 °C) then siphon to fermenter. Shake bucket or carboy to aerate wort, then add cold water to make 5 gallons (19 L). Pitch yeast. (You will need the yeast from a 64 oz. (1.9 L) starter or 1 cup of yeast sediment. Alternately, you can use two pitchable packs, tubes or vials of yeast). Ferment at 68 °F (20 °C). Bottle when fermentation stops. Be sure to stir in corn sugar well. Bottle condition at room temperature for 2 weeks then refrigerate for 1 week before drinking.

Partial Mash Option:

Replace malt extracts and sugar with 4.0 lbs. (1.8 kg) Ironmaster Canadian LME, 4 lbs. (1.8 kg) 6-row brewers malt and 0.33 lbs. (0.15 kg) corn sugar. Perform a partial mash by steeping the crushed grains in 1.25 gallons (4.7 L) of water at 150 °F (66 °C) for 45 minutes.

Following the partial mash, rinse grain bag with 1.25 gallons (4.7 L) of water at 165 °F (74 °C). Add 1.5 gallons (5.7 L) of water and heat this 4 gallons (15 L) of wort to a boil and add malt extract and sugar. Then, follow the extract instructions above to complete the brewing.

Gritty Gardener Australian Sparkling Ale

(5 gallons, extract with grains)

OG = 1.056 FG = 1.015
IBUs = 24 ABV = 5.3%

This golden beer goes down smoothly, but packs a wallop. Make sure the hedge trimmer is put away before you reach for this beer from down under.

Ingredients

3.3 lbs. (1.5 kg) Coopers Light LME
2.5 lbs. (1.1 kg) Northwestern Gold DME
0.5 lbs. (0.23 kg) crystal malt (20 °L)
0.75 lbs. (0.34 kg) corn sugar
6.75 AAUs Cluster hops (bittering) (1.5 oz./57 g of 4.5% alpha acids)
1/2 tsp. Irish moss
1/2 tsp. yeast nutrient
3 packages Edme dried ale yeast
3/4 cup corn sugar (for priming)

Step by step

Add 1 gallon (4 L) of water to your brewpot, heat water to 168 °F (76 °C) and steep crystal malt for 30 minutes. Add 3 gallons (11 L) of water to grain "tea" and bring this 4 gallons (15 L) of liquid to a boil. Remove brewpot from heat and add malt extracts and corn sugar. Stir thoroughly to dissolve extracts and sugar completely. Return to a boil and add the bittering hops. Boil for 45 minutes. Add Irish moss and yeast nutrient during last 15 minutes of the boil. When done boiling, put a lid on the brewpot and cool in your sink. Change cooling water every five minutes until brewpot is cool enough to touch, then add ice to cooling water. Chill the wort to 72 °F (22 °C) then siphon to fermenter. Shake bucket or carboy to aerate wort, then add cold water to make 5 gallons (19 L). Rehydrate dried yeast and pitch to fermenter. Ferment at 68 °F (20 °C). Bottle when fermentation stops. Be sure to stir in corn sugar well. Bottle condition at room temperature for 2 weeks then refrigerate for 1 week.

Partial Mash Option:

Replace malt extracts, specialty grain and sugar with 3.75 lbs. (1.7 kg) Cooper's Light LME, 4 lbs. (1.8 kg) 2-row pale malt, 0.5 lbs. (0.23 kg) crystal malt (20 °L) and 0.75 lbs. (0.34 kg) corn sugar. Perform a partial mash by steeping the crushed grains in 1.5 gallons (5.6 L) of water at 150 °F (66 °C) for 45 minutes. Following mash, rinse grain bag with 1.5 gallons (5.6 L) of water at 165 °F (74 °C). Add 1 gallon (3.8) of water and heat this 4 gallons (15 L) of liquid to a boil and add malt extract and sugar. Then, follow the extract instructions to complete the brewing.

LAGERS

Vandervecken's Pushmower (Netherlands Export)

(5 gallons, partial mash)

OG = 1.052 FG = 1.014
IBUs = 20 ABV = 4.9%

Planting tulips this year? Once they are in the ground, pop the top on one of these. A rounded maltiness and clean finish make this beer both rewarding and refreshing.

Ingredients

3.75 lbs. (1.7 kg) Bierkeller Extra Light DME
2.5 lbs. Briess Light LME
5.75 AAUs Hallertauer Hersbrucker hops (bittering) (1.2 oz./34 g of 5% alpha acids)
0.5 oz. (14 g) Hallertauer Hersbrucker hops (aroma)
Wyeast 2042 (Danish Lager) or White Labs WLP802 (Czech Budejovice Lager) yeast
1 cup light DME (for priming)

Step by step

Bring 4 gallons (15 L) of water to a boil. Add malt extracts and bittering hops. Boil for 60 minutes. At the very end of the boil, add the aroma hops to the kettle and immediately cover and turn off the heat. Cool the wort in your sink or bathtub. Change cooling water every five minutes until brewpot is cool enough to touch, then add ice to the cooling

water. Chill the wort to 60 °F (15 °C) then siphon to fermenter. Shake bucket or carboy to aerate wort, then add cold water to make 5 gallons (19 L). Pitch yeast. (You will need the yeast from a one-gallon (3.8 L) starter or 2 cups of yeast sediment from a previous batch or brewpub). Ferment at 55 °F (13 °C) for two weeks. Lager at 32 ° F (0 °C) for 45 days. Bottle when lagering is complete. Be sure to stir in corn sugar well. Bottle condition at room temperature for 3 weeks then refrigerate for 1 week before drinking.

Partial Mash Option:

Replace malt extracts with 2 lbs. (0.91 kg) 2-row Pilsner malt, 1.5 lbs. (0.68 kg) flaked maize and 0.25 lbs. (0.11 kg) CaraPils malt. Perform a partial mash by steeping the crushed grains and flaked maize in 1.25 gallons (4.7 L) of water at 150 °F (66 °C) for 45 minutes. Following mash, rinse grain bag with 1.25 gallons (4.7 L) of water at 165 °F (74 °C). Add 1.5 gallons (5.7 L) of water and heat this 4 gallons (15 L) of wort to a boil and add 4 lbs. DME. Then, follow instructions above to complete the brewing with one exception: add 1/2 tsp. Irish moss for final 15 minutes of boil.

Toro Toro Toro Lager (Dry Beer)

(5 gallons, extract only)

OG = 1.042 FG = 1.011

IBUs = 10 ABV= 4.0%

A well-run fermentation is the key to brewing this beer. Do it right and you will have a dry but balanced beer that finishes clean.

Ingredients

3 lbs. (1.4 kg) Munton's Extra Light DME
2 lbs. (0.91 kg) rice syrup solids
2.5 AAUs Liberty hops (bittering) (0.5 oz./14 g of 5% alpha acid)
0.5 oz. (14 g) Mt. Hood hops (aroma)
1/2 tsp. yeast nutrients
Wyeast 2035 (American Lager) or White Labs WLP840 (American Lager) yeast
7/8 cup corn sugar (for priming)

Step by step

Bring 4 gallons (15 L) of water to a boil. Remove brewpot from heat and add malt extract and rice syrup solids. Stir thoroughly to dissolve extracts completely. Return to a boil and add bittering hops. Boil for 60 minutes. Add yeast nutrients in final 15 minutes of the boil. When done boiling, add aroma hops and put a lid on the brewpot. Cool the wort in your sink. Change cooling water every five minutes until brewpot is cool enough to touch, then add ice to cooling water. Chill the wort to 60 °F (15 °C) then siphon to fermenter. Shake bucket or carboy to aerate wort, then add cold water to make 5 gallons (19 L). Pitch yeast. (You will need the yeast from a one-gallon (3.8 L) starter or 2 cups of yeast sediment from a previous batch or brewpub). Ferment at 55 °F (13 °C) for 2 weeks. Lager at 32 °F (0 °C) for 30 days. Bottle when lagering is finished. Bottle condition at room temperature for 3 weeks then refrigerate for 1 week before drinking.

Partial Mash Option:

Replace malt extracts and rice syrup solids with 4 lbs. (1.8 kg) 2-row Pilsner malt, 1 lb. (0.45 kg) DME and 2 lbs. (0.91 kg) rice syrup solids. Perform a partial mash by steeping the crushed grains in 1.25 gallons (4.7 L) of water at 150 °F (66 °C) for 45 minutes. Following mash, rinse grain bag with 1.25 gallons (4.7 L) of water at 165 °F (74 °C). Add 1.5 gallons (5.7 L) of water and heat this 4 gallons (15 L) of wort to a boil and add malt extract and rice syrup solids. Then, follow the extract instructions to complete the brewing.

American Beers

The following two recipes are for "American" light lagers with a little extra hop flavor. Both follow the same brewing procedures.

Nothing Runs Like A Beer (American Rice Pilsner)

(5 gallons, extract with grains)

OG = 1.045 FG = 1.012

IBUs = 17 ABV = 4.3

Your friends in St. Louis will find this beer recognizable, but may wonder what that added flavor is. (Hint: it rhymes with "pops.")

Ingredients

3.3 lbs. (1.5 kg) Northwestern Light LME
1.5 lbs. (0.68 kg) Munton's Extra Light DME
1 lb. (0.45 kg) rice syrup
2 AAUs Crystal hops (bittering) (1 oz./28 g of 2% alpha acid)
3 AAUs Liberty hops (bittering) (1 oz./28 g of 3% alpha acid)
0.25 oz. (7 g) Crystal hops (flavor)
0.25 oz. (7 g) Liberty hops (flavor)
0.25 oz. (7 g) Saaz leaf hops (aroma)
Wyeast 2035 (American Lager) or White Labs WLP840 (American Lager) yeast
1 cup corn sugar (for priming)

Knee High by the Fourth of July (American Corn Pilsner)

OG 1.043 FG 1.011 IBUs 15 ABV 4.1

The flavor of corn rounds out the dryness of this crisp, balanced beer.

Ingredients

4 lbs. (1.8 kg) Alexander's Light LME
2 lb. (0.90 kg) brewer's corn syrup
4 AAUs Hallertau Hersbrucker hops (1 oz./28 g of 4% alpha acid)
0.5 oz. (14 g) Hallertau Hersbrucker hops (flavor)
0.5 oz. (14 g) Hallertau Hersbrucker hops (aroma)
1/2 tsp. yeast nutrient
Wyeast 2035 (American Lager) or White Labs WLP840 (American Lager) yeast
1 cup corn sugar (for priming)

Step by step

Bring 4 gallons (15 L) of water to a boil. Remove brewpot from heat and add malt extract and rice or corn

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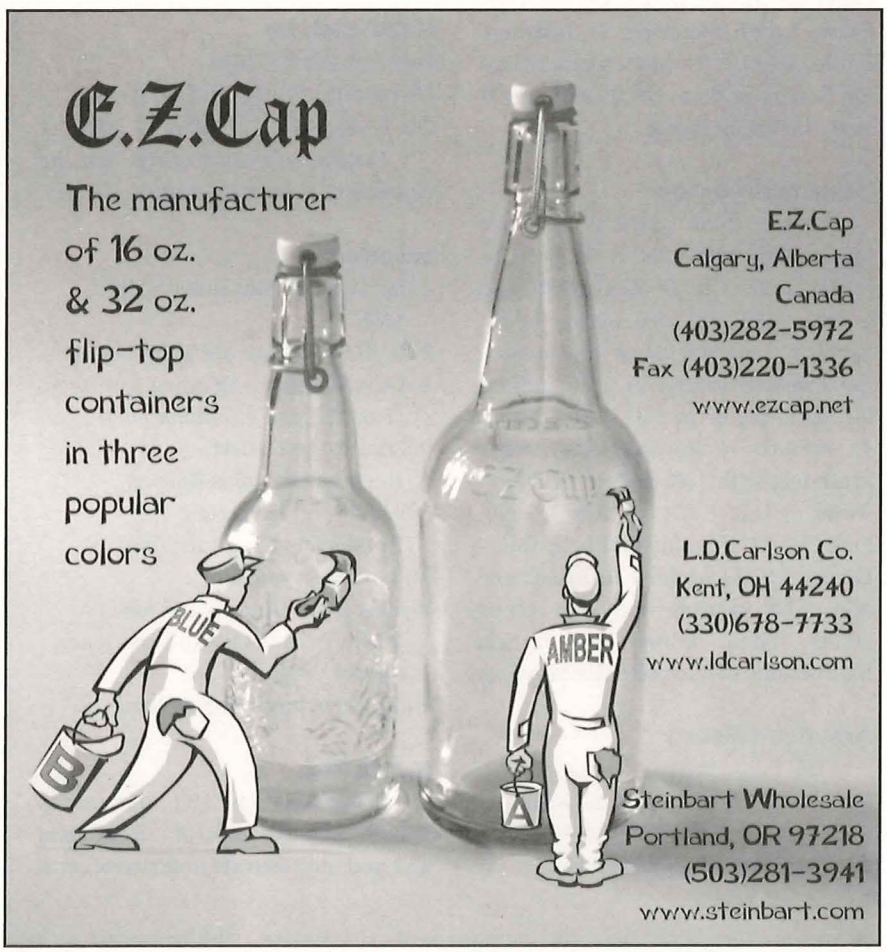

syrups. Stir thoroughly to dissolve extract and syrup completely. Return to a boil and add bittering hops. Boil for 60 minutes. Add flavor hops in final 15 minutes of the boil. When done boiling, add aroma hops and put a lid on the brewpot. Cool the wort in your sink. Change cooling water every five minutes until brewpot is cool enough to touch, then add ice to cooling water. Chill the wort to 60 °F (15 °C) then siphon to fermenter. Shake bucket or carboy to aerate wort, then add cold water to make 5 gallons (19 L). Pitch yeast. (You will need the yeast from a one-gallon (3.8 L) starter or 2 cups of yeast sediment from a brewpub or homebrew club member). Ferment at 55 °F (13 °C) for 2 weeks. Lager at 32 °F (0 °C) for 20 days. Bottle when lagering is finished. Be sure to stir in corn sugar well. Bottle condition at room temperature for 2 weeks then refrigerate for 1 week before drinking.

Partial Mash Option:

Replace malt extracts and rice solids with 2.5 lbs. Northwestern Light LME, 4.0 lbs. 6-row pale malt and 1.0 lbs. rice syrup solids. Perform a partial mash by steeping the crushed grains in 1.25 gallons of water at 150 °F (66 °C) for 45 minutes. Following mash, rinse grain bag with 1.25 gallons of water at 165 °F (74 °C). Add 1.5 gallons of water and heat this 4 gallons of wort to a boil and add malt extract and rice syrup solids. Then, follow instructions above to complete the brewing.

High Gravity Option:

To produce these beers in a way similar to how the big breweries do it, multiply the amounts of all the ingredients by 1.2 and brew a slightly stronger beer. Then, when it comes time bottle, add 1 gallon (3.8 L) of water to the finished beer. This water should first be boiled for 15 minutes, then cooled to 40 °F (4.4 °C). Stir thoroughly (but quietly) to mix beer, water and priming sugar. The result will be 6 gallons (23 L) of beer that tastes like the five-gallon (19-L) recipes, but slightly drier. ■

Joe and Dennis Fisher wrote "Brewing with Honey" in the Sept. 2002 BYO.

Hot Wort!

What you should do during the boil

Story by Chris Colby

Table 1
Hop Utilization* vs. Specific Gravity

°Plato	SG	Hop utilization (%)
12	1.048	25.0
13	1.052	24.7
14	1.056	24.4
15	1.060	24.0
16	1.064	23.8
17	1.068	23.4
18	1.072	23.0
19	1.076	22.7
20	1.080	22.3
21	1.084	21.9
22	1.088	21.6
23	1.092	21.2
24	1.096	20.9
25	1.100	20.5
26	1.104	20.2
27	1.108	19.8
28	1.112	19.5

* for pellet hops boiled for one hour

Table 2
Boil Times for Selected Beer Styles

Beer Style	Boil Duration
ALES	
Pale Ale	90 min
Porter	90 min
Stout	90 min
Scottish Ale	60–90 min
Belgian Ales	120 min (varies)
Weizen	90–120 min
Altbier	90–120 min
Kölsch	60–100 min
LAGERS	
Pilsner	45–120 min
Helles	90–120 min

List of recommended times compiled primarily from Classic Beer Style Series of books (Brewer's Publications, Boulder Colorado)

Homer Simpson is my favorite TV character. One of my favorite Homerisms comes when Homer realizes that he is no longer in touch with modern music and he vows to "get out of this rut . . . and back into the groove." It's easy to get in a rut while brewing. Many homebrewers continue to follow the same brewing procedures they learned when they started. It's possible, however, that better information has filtered into the homebrewing community since you began. I've finally unlearned much of what I "knew" and have started making a few changes when I boil.

Homebrewers employ a variety of equipment to boil their worts, ranging from kitchen pots on the stovetop to modified kegs heated by propane burners. Most homebrew setups involve a "simple" kettle — one with no internal structures for heating or circulation — heated by an external heating source.

Concentrated vs. full wort boils

Most extract brewers perform concentrated wort boils. A "thick" wort is boiled then diluted with water to working strength prior to fermentation. The smaller the volume of wort boiled, the higher the specific gravity of that wort in the kettle. For example, 7 lbs. (3 kg) of liquid malt extract (LME) dissolved in 5 gallons (19 L) of water yields a specific gravity of 1.051. The same amount of LME in 3 gallons (11 L) yields a specific gravity of 1.086. To calculate your boiling gravity, multiply your target original gravity (OG) times your batch size divided by the amount of wort you are boiling. For example, if you are making a 5-gallon (19 L) batch of porter with a target OG of 1.060 and boiling 3 gallons (11 L) your boiling gravity is 60(5/3) = 100 (a specific gravity of 1.100).

In a full-wort boil, the entire wort is boiled at working strength. At the beginning of the boil, the volume of wort is greater than the batch size and more dilute. Boiling condenses and concentrates the wort to working volume and concentration. A five-gallon brewer will typically start with 5.5 gallons (21 L) of wort and boil it down to just over five gallons (19L). After cooling, they can transfer five gallons (19 L) of wort to the fermenter, leaving the trub and hop debris in the kettle. There are several advantages to this method.

Hop utilization increases in full wort boils compared to boiling a concentrated wort. In other words, you get more bitterness out of your hops as your wort gets thinner. Table 1 shows hop utilization vs. specific gravity.

A full wort boil also leads to less wort darkening. The more concentrated the sugars are in the boil, the more likely they are to react with each other or amino acids in the wort.

A full-wort boil also promotes better break formation. When heated, proteins, carbohydrates and tannins in the wort react and form what brewers call break material. Some of this break material appears as solids while the wort is boiling. This is called hot break (or hot trub). Other break material only becomes insoluble in cold wort and is called the cold break (or cold trub). If proteins or lipids don't get formed into break, they can carry over into the finished beer and cause problems with chill haze. They also make the beer susceptible to bacterial growth.

The advantage of a concentrated wort boil is the convenience while the advantages of a full-wort boil relate to beer quality. Extract brewers should therefore seek to boil as much wort as the size of their brewpot, power of their stove and time constraints allow. Many extract recipes give specific amounts of liquid to boil the malt extract in. These recipes are meant to be quick and simple to brew and the recommended wort volume reflects this. You can — and should — boil larger volumes if you can.

Boil times

All brewers must decide how long to boil their wort. These days, most

homebrew recipes call for a one-hour boil. However, an even longer boil may help improve beer clarity and stability.

The longer that wort is boiled, the more break material is formed. More break material removed from your wort will ultimately yield clearer beer. Also, your beer will more stable. So, if you have the time on brewing day, try extending your boil times and see if that makes a difference in your final beer. Note that you will need a larger initial volume if you are boiling for 90 minutes. For 5 gallons (19 L) of beer, you should start with 5.75 gallons (22 L) of wort compared to 5.5 gallons (21 L) for a 60 minute boil. You can add 0.25–0.33 gallons (1–1.2 L) to that to account for the hops and trub that settles to the bottom of the kettle.

It's interesting to note that traditionally some of the lightest-colored beers got boiled the longest. See Table 2 for a list of recommended boil times for various beer styles.

For extract brewers, there is one further variable to consider. Many liquid malt extracts (LMEs) are already boiled. So, when making beer from LME, you can boil for at little as 15 minutes, just long enough to sterilize the wort. Beers made from dried malt extract (DME) still need to be boiled for at least 45 minutes.

What happens during the boil?

A lot happens during the boil, even though brewers don't do much during this period. Let's tour the boil and find out what's going on and what, if anything, we can do.

Wort Expansion: Wort expands when heated. A five-gallon brewer is unlikely to notice this, but larger-volume homebrewers may notice the volume shrinkage upon cooling. At 68 °F (20 °C), ale fermentation temperature, wort occupies about 4% less volume than it did at boiling (around 215 °F/102 °C for most worts). For a 5-gallon (19-L) batch, this amounts to just over two "lost" (12 oz./355 mL) beers.

Evaporation of Water: When wort boils, water evaporates from it. One consequence is that the wort volume will shrink. This shrinking more than counteracts the expansion due to heating, which stops once boiling starts and the temperature is no longer rising.

An easy way to determine the vigor of your boil is to measure the evaporation rate. To calculate this, measure your wort volume at the beginning of the boil and again one hour later. Your evaporation rate, given in percent per hour, is calculated as:

$$Evaporation_{\%/\,hour} = [1 - (\frac{volume_{t=60\,min}}{volume_{t=0\,min}})]$$

For example, let's say you had 6 gallons (23 L) at the beginning of the boil (time 0) and 5 gallons (19 L) one hour later (time 60). Your evaporation rate would be 1-(5/6) = 0.1667, an evaporation rate of 16.67%. For most homebrews, a 10% evaporation rate per hour is a good wort vigor. Less than this and your hop extraction and break

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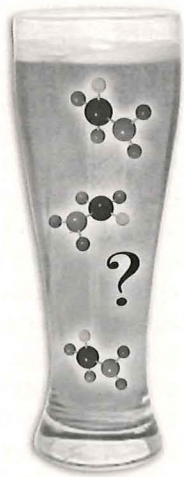

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formation suffers. A greater evaporation rate can yield too much darkening.

Another consequence of evaporation is that the concentration of sugars will increase in the wort. You can estimate how the gravity of your wort will change by using the formula $C_1V_1 = C_2V_2$. In the equation, C_1 is the concentration of wort at the beginning of the boil and V_1 is the volume at the beginning of the boil and C_2 is the unknown concentration of wort at the end of boil, when the wort will have a volume of V_2.

Let's say that you have 6 gallons (23 L) of wort at a specific gravity of 1.040 and plan to boil it down to 5 gallons (19 L). Substituting the numbers into the equation, we get 6(40) = 5(X), where X is our unknown specific gravity. (Notice that you only use the decimal portion of specific gravity — i.e. 1.040 becomes 40.) Solving for X, we get 6(40)/5 = 240/5 = 48. So our expected specific gravity would be 1.048.

This formula will, however, consistently overestimate your final gravity. Your early reading of specific gravity will be inflated by soluble proteins and other molecules in the wort. These will cause your hydrometer to float higher. Late in the boil, these substances will have precipitated out and will not affect the gravity. My estimate is usually off by three or four gravity points when I use this formula.

A third consequence of the evaporation of water is that color-bearing molecules will become more concentrated, darkening the wort.

Wort darkens for two reasons. Primarily, the wort gets darker because it is getting more concentrated and secondarily because chemical reactions are forming colored molecules from colorless precursors. The carmelization of sugars is one example of this type of reaction. Maillard reactions are another. Carmelization occurs when (colorless) sugars react with other sugars and form color-bearing polymers. Maillard reactions occur between sugars and amino acids.

If you want to differentiate between the effect of wort concentration and direct color development in your wort, try this experiment. Take a sample of wort immediately after the hot break then take a second sample at the end of your boil. You can compare the two to see the extent of wort darkening. To estimate how much of the darkening was due to color-developing reactions, dilute your final wort back to the concentration it was when you took the first sample. Comparing the early and late worts, corrected for loss of water, should show you how much wort color comes from Maillard reactions and sugar carmelization.

Don't take this test too seriously, though. Other things that affect color are going on as well, including the effect of the precipitated break material. However, this is good, quick check for extract brewers whose beers are too red. You can check if the color is developing during the boil or if your

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extract was simply carrying too much color to begin with.

Evaporation of DMS: Other volatile chemicals, including DMS, are also evaporated during the boil. DMS is a molecule that leads to a cooked corn smell in the beer. Precursors to DMS are found in lightly kilned malts. A good, rolling boil — followed by fast wort cooling — will minimize DMS.

Chemical reactions: Wort is a complex mix of water and biochemical molecules, including carbohydrates, proteins, lipids and other molecules. When you heat this mixture, many chemical reactions occur. I've already mentioned two important reactions — those that form Maillard products and those that form break material.

The chemical reactions involving hops and their bittering compounds are obviously of interest to brewers. In the boil, alpha acids in hops are converted via heat to iso-alpha acids. Alpha acids are insoluble in wort and are not bitter. Iso-alpha acids, however, are both soluble and bitter. The amount of alpha acids converted to iso-alpha acids depends on how long the wort is boiled and the specific gravity of the wort. Most brewers boil their bittering hops for at least one hour. On average, a homebrewer will convert 25% of the alpha acids in their hops to iso-alpha hops in a one-hour boil.

In the boil, calcium ions in the water and phosphates derived from the grain react and drop out of solution. This results in a drop in pH. The wort should drop from a pH of 5.4–5.6 to a pH around 5.2. If your wort pH is too high, the resulting beer may taste dull and lifeless. Adding a small amount of calcium — about 1/4 tsp. gypsum or calcium chloride per 5 gallons (19 L) — can help the pH get to the right point.

Convection currents: Wort is not heated evenly. When temperature differences within a volume of liquid exist, convection currents result. In commercial kettles, the shape of the kettle — and the presence and placing of internal heating elements — are designed to induce currents in the kettle. Convection currents help mix the wort and help with break formation. Homebrewers don't need to worry about convection currents. Stirring the wort a few times during the boil should ensure adequate mixing.

Cessation of biological activity: Boiling will kill bacteria and yeasts. Some bacteria and fungi can form spores and survive a boil, but there are no common wort or beer spoilers that do this. Boiling will also inactive the enzymes you utilized in the mash.

Kettle additions: The boil is also a time for kettle additions such as Irish moss, which helps clear break material, and yeast nutrients.

Conclusion

Pay attention to your boiling procedures and you'll make better beer, which according to Homer is "the cause of — and solution to — all of life's problems." ■

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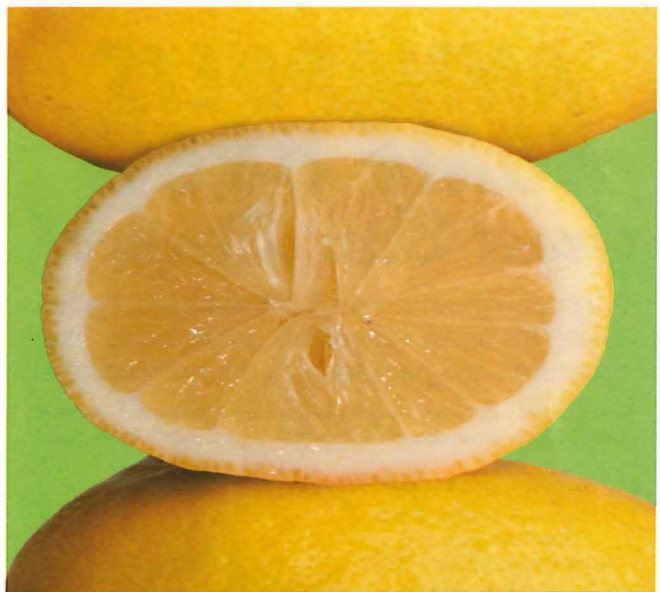

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Oxidation = Bad

Do you really want your beer to taste like paper?

Homebrew Science

by Steve Parkes

Throughout history it has been the goal of commercial brewers to extend the shelf life of their product. At one point in time, protecting beer from the effects of bacterial contamination was the key. The next limiting factor proved to be haze stability, which specifically means the hazes caused by proteins and tannins in the beer. These days we are left with the most difficult problem of all, that of flavor stability. We can make bacteria-free beer that stays clear for months, but we cannot ensure that the flavor remains consistent for much over 120 days. The main culprit for this flavor instability is oxidation of the beer's flavor compounds. Ironically the majority of the compounds that are most susceptible to oxidation are derived from malt and hops, so perhaps the mainstream brewers are on to something brewing with all that rice and corn.

Mechanisms

Recently — in different articles in two different brewing technical journals — two different opinions on oxidation were offered. One group claimed that the stale flavor was mainly caused by oxygen uptake by the beer on its way from the storage tank to the bottle. The other group maintained that flavor stability is not related to beer packaging, but rather to wort preparation. This shows researchers working in brewing labs in Germany and Belgium reaching different conclusions as to where the oxidative damage is done to the beer. Both agreed the oxidizing agent was oxygen, but both contradicted each other as to the source of the oxidized compounds.

Thus the lines are drawn in the professional ranks, so it's no wonder there's confusion in the home brewing literature. It can be agreed that contact with oxygen throughout the process of beer production is largely detrimental to the beer's final flavor, the degree to which that is affected by contact with oxygen early in the process rather than the finished beer is still a subject for debate.

While the greatest damage can be done to your beer by contact with oxygen, it should also be remembered that oxygen does not directly have to be involved for a compound to become oxidized. Beer is "born" with a certain "reducing power." Depending on the ingredients used to brew it, it has a certain finite ability to resist the effects of oxidation. Improper handling of the beer, the raw materials and even the mash or wort can use up this capacity for self-protection, leaving the beer more vulnerable to the effects of oxygen later in the process. In Japan research is focusing on measuring the beer's total reducing power (ability to resist oxidation) when it is packaged in order to predict its shelf life. Historically brewers have used 'forcing" tests, in which the package is exposed to extreme temperatures for a week or so to mimic what the beer may encounter in the trade over a longer period. Essentially the degradation of flavor due to oxygen or bacterial contamination is sped up so it can be discerned in the brewery before the beer is too long on the liquor store shelves. A drawback to this is that the chemical reactions responsible for oxidized beer flavor are different at higher temperatures from the normally-stored product. So, the forced sample may not give a true indication of the actual aged beer flavor. Of course, if "normal" storage includes abusive conditions such as a summer trip through death valley in a black-painted, unrefrigerated truck with faulty shocks, then these tests are not out of the scope of reality.

We can make bacteria-free beer that stays clear for months, but we cannot ensure that the flavor is consistent for much over 120 days.

The dominant oxidized characters in pale, light-tasting beers is a papery or cardboard-like flavor caused by a class of compounds known as aldehydes (often referred to as carbonyls in the literature). Acetaldehyde is the most common one in beer and is produced in prodigious amounts by yeast during primary fermentation only to be reabsorbed during maturation. It can, however, combine with sulfur dioxide in the beer and survive into the package where it may break down again to result in acetaldehyde in the beer. Another famous one is trans-2-nonenal and is largely responsible for the papery, cardboard character in stale, old beer. Carbonyls find their way into beer from a variety of sources:

- Short chain fatty acids (small organic acid molecules) derived from malt can oxidize to their respective aldehydes.
- Smaller aldehydes can combine to form larger unpleasant tasting compounds in a condensation reaction
- Hops contribute isomerized alpha acids to beer, which can become oxidized via fatty acids to stale tasting aldehydes.
- Higher alcohols produced during fermentation oxidize in beer to form these same stale tasting aldehydes

There is well-documented evidence that melanoidins produced during malting are powerful, natural antioxidants in beer. Melanoidins are produced during malt kilning and crystal malts and particularly darker more

roasted malts contain a lot of them. However, if they become oxidized earlier in the process they can actually mediate the oxidation of other beer components, mainly higher alcohols, to their corresponding aldehydes. All of this is what worries proponents of "hot side aeration," a term coined to describe the influence oxygen encountered early in the process in the brewing vessels has on final beer flavor. Researchers have explored this subject with great zeal in recent years in an attempt to find the answer to flavor stability but find a number of contradictory factors at play. For example total exclusion of oxygen from the mash produces a beer with marginally better flavor stability but poor haze stability. Well-modified, well-kilned malts such as British malts have much lower levels of the lipoxygenase enzyme implicated by some researchers in the early oxidation of short-chain fatty acids to aldehydes in the mash. Cardboard flavor is not the only oxidation characteristic common in our beers. Darker, fuller-flavored beers and strong beers all exhibit oxidation characteristics in different ways. Alcohol itself can oxidize to acetaldehyde, which may impart a rotten apple flavor. Amber ales and amber lagers tend to become sweeter and develop cloying, toffee-type characters. I would go as far as to suggest that a good Marzen should demonstrate a toffee sweetness that comes from long periods of aging in the brewery. Stouts are loaded with melanoidins from the roasted malt and so are a little more stable, and also so rich in flavor that a lot of faults remain hidden. The main fault very dark beers exhibit is cheesiness from the oxidation of hop acids. This can happen during storage of hops, so take care to seal up those bags. The biggest advantage home brewers have over their commercial counterparts is that the majority of their beer is bottle conditioned. The yeast is a great natural anti-oxidant and mops up any oxygen in the bottle preventing oxidation reactions.

A good Märzen should demonstrate a toffee sweetness that comes from long periods of aging in the brewery.

Implications

Recently a paper published in the MBAA Technical Quarterly by researchers at South African

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Breweries put forth the following proposal. Beer flavor is stable for only a few weeks at best, then undergoes a rapid change as oxidized characters develop. This is followed by a long period of very gradual change during which the beer is relatively consistent. They suggested that larger domestic brewers with their "born on dating" and refrigerated storage attempt to market "fresh beers," while imports have already reached the point where they would be considered oxidized by the time they appear on American store shelves. (They must also be implying that it is those oxidized flavors that are desired in imported beers.) Having tasted both fresh cask conditioned Bass Ale with its soft, sulfury, delicate hop aroma, and smooth malt balance and compared it with the toffee-sweet, overly-malty version I find in this country, I must say I feel the researchers are on to something.

Most microbrews are on the shelves during their period of most rapid change. In your local brewpub however, you are far more likely to find fresh versions of the classic world beer styles. As such, they may not actually closely resemble what you think of when you compare them with the imported original. It's the fresh version you should be attempting to emulate.

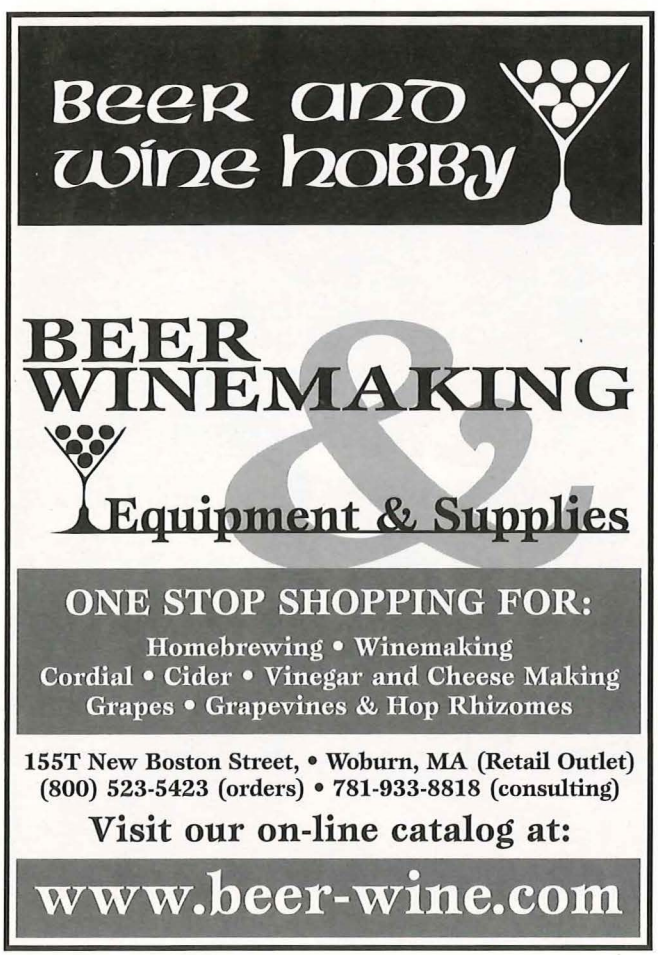
Avoiding oxidation

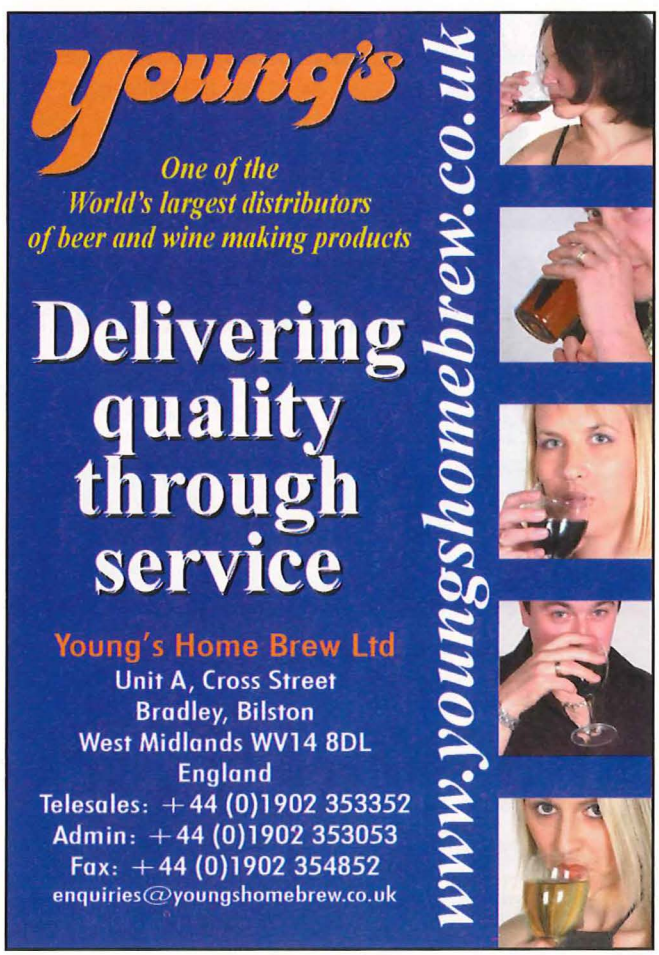
There is only one point in the brewing process where oxygen is a good thing. Freshly-cooled wort should be injected with air or oxygen to provide the yeast with oxygen for cell membrane synthesis during the initial stages of fermentation. After about a day, the dissolved oxygen in the actively fermenting wort is less than 30 parts per billion, which is as low as it will ever be.

Avoiding oxygen pickup

Brewhouse Malt that has been premilled is more likely to produce stale flavors that whole malt milled just before it is needed. Avoid splashing wort all over the top of the mash while recirculating or vorlauf. Run wort down the side of the mash tun or gently pour the wort through a flexible hose onto the surface of the mash bed. Do not allow wort to fall to the bottom of the kettle foaming up in the process. Pumps, if you're using one, with leaking seals will actually draw oxygen into the flow of wort, causing oxidation. And, obviously, don't aerate the wort on the hot side of the heat exchanger.

Fermentation After around 4 hours, almost all of the oxygen added to the wort will have been mopped up by the yeast. Evolving CO_2 bubbles will quickly strip away the excess. At the end of fermentation, however, there should be a blanket of CO_2 above the beer that will protect the beer from air contact. However, when you transfer the beer from the primary fermenter to your secondary aging tank, O_2 pickup is likely. Care must be taken to purge the





receiving vessel with CO_2 prior to transferring the beer across. A good way to do it is to fill the receiving vessel with sanitizer then push the it out using CO_2 pressure from a gas bottle, leaving the vessel filled with CO_2.

Packaging Professional brewers fill kegs and bottles regularly and so have access to cleaning/filling machines that will take care of the air in the package for them. The homebrewer's practice of siphoning primed, yeasty beer into an air-filled bottle does a couple of things. First, the beer picks up a lot of dissolved air, but then the yeast in the beer absorbs it all. Brewers who filter then bottle face the same issues as commercial brewers with regards to oxidation characters. Filtration is a big area for oxygen pickup. It's important to realize that this will not result in the immediate appearance of these characteristics, but will hasten their inevitable development. Filling the filter and all the hoses with water and removing it by pushing it out with CO_2 will help reduce the air in the filter itself. Large breweries use de-aerated water to chase beer through lines. The receiving tank should have been flushed /purged with an inert gas prior to filling. The surest way to do this is to fill it with water or sanitizer then push the liquid out with CO_2.

> After a day the dissolved oxygen in the actively fermenting wort is less than 30 parts per billion, which is as low as it will ever be.

By now all brewers should understand the importance of minimizing air in a bottle, since as little as 1 mL of air in the headspace of a bottle is enough to oxidize the entire contents. Purging the bottles with CO_2 prior to filling, gentle filling and capping on foam will go a long way toward minimizing air pickup. Low air at bottling however does not mean your bottles will last forever, partly because of the oxidation your beer has already been exposed to and also because air will leak into the bottle around the seal of the cap.

And, if I may add a final note...

The best way to avoid oxidation characters in your beer remains to keep it cold and drink it quickly, as the most effective way to stop a beer from oxidizing is to drink it. ■

Steve Parkes writes the Homebrew Science article in each issue of BYO.

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Two easy ways to soup up your Corney

story and photos by Thom Cannell

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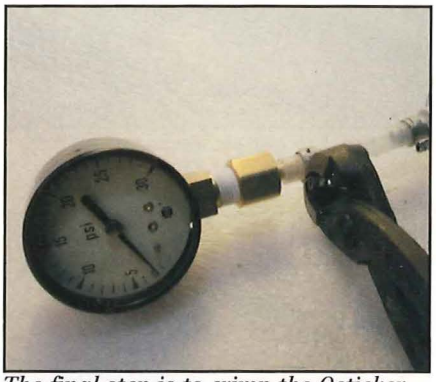

The final step is to crimp the Oeticker clamps to hold the tubing.

This month we'll tackle a couple of easy projects that will make your summer beer drinking easier and more pleasurable. First is a way to answer the burning question "Is my kegged beer carbonated? And is it carbonated to style?" Kegging is very cool, very easy and — once you've popped the bucks for kegs, regulator and CO_2 tank — highly portable. But getting the right dispensing pressure can be tricky. We'll rescue you.

The second project, also keg-based, will make flavoring kegged beer — whether with dry hops or your own blend of spices — cleaner and even a bit more predictable.

Pressure Gauge

Cornelius kegs offer brewers convenience in storage, carbonation and ease of transport. You may carbonate beer in kegs with the addition of sugars (cane, corn, molasses, brown sugar, maple syrup and etc.) or direct carbonation with CO_2 gas. Piece of cake.

When it comes time to dispense, achieving the correct dissolved volumes of CO_2 is not as clear-cut. For each type of beer you must measure both temperature and pressure. Then a table tells you what, at a given temperature, the gas pressure on the beer should be. For example, the tables tell you that for an English pale ale you should have 2.2 volumes of CO_2, and a Bavarian weissbier should have approximately 3.0 volumes of gas.

The difficulty is measuring the pressure accurately. *(For a complete chart, see "Carbonate with Your Keg" in the May 2000 issue of BYO. For an explanation of carbonating in the keg see the May-June 2002 issue.)*

If your CO_2 gauges are like mine (0-100 psi or 0-7 bar), they are difficult to read at low pressures because useful pressures occupy only a small percentage of the measurement range. Where's my magnifying glass? What if you had a gauge designed to read low pressures, a gauge that would connect directly to your keg?

To create such a device is both simple and inexpensive. All that is required is a spare gas-in connector (ball-lock or pin-lock depending on your keg,) a piece of hose, two clamps and a pressure gauge in the desired pressure range.

Step-by-Step

Select either a 0–15 0r 0–30 psi pressure gauge (0–1 or 0–2 bar) and brass or nylon barbed fitting. Mine came from a large industrial supply house. Scrounge or purchase a gas-in connector and some new, freshly-sanitized hose.

Wrap the gauge's threads with Teflon tape or other pipe dope and tighten barb to gauge.

Push the tube onto one fitting and clamp with an Oetiker or some other clamp. Thread a second clamp over the tube, insert the other barbed fitting and clamp.

Done! To use the gauge, just attach the quick connect to the gas-in line of your keg. I rushed out to discover that my nice Old Speckled Hen clone had 6 psi pressure at 39°F (3.8 °C) or 1.96 volumes of gas. According to the chart, an additional 2 psi would make for perfect carbonation. At last I know.

Remember that it takes a while for carbon dioxide to dissolve into beer. Pressure readings taken before the beer and gas are at equilibriumwill lead you to overestimate the level of carbonation. Wait at least a day with the beer under CO_2 pressure before making the final adjustments to your beer's carbonation.

COSTS/PARTS/TOOLS

TOOLS: hack saw, soldering iron, drill bits and motor, file, propane torch, silver solder and flux.

COSTS: silver solder and flux (we used StayBright and Stay-Clean liquid flux from Harris Welco) for less than $30 if purchased new and we used less than 5%.

The finished gauge measures the CO_2 pressure on a keg of beer.

Before welding, remove the pressure-relief valve from the lid.

Keg Lid Hanger

Do you dry hop your beers? Many of us take a crack at pumping our pale ales as full of the aroma of fresh hops as we know how. Dry hopping in secondary is common, as is dry hopping in the keg. Having struggled with fishing a hop bag out of the neck of a glass fermenter (never again!) and having had my racking cane clog with both pellets and leaf hops, I've decided that dry hopping absolutely must be done in buckets or kegs.

Hops float and a mesh bag full of hops will float atop your beer forever, failing to properly infuse the beer with flavor. The answer is to weight the hop bag, commonly with a chunk of stainless steel or glass; anything that is inert and easily sterilized or sanitized will work. What's not obvious is the chore of fishing a hop bag out of a keg.

We kicked this problem about in our homebrew club and Dean McCracken suggested welding a stainless steel hanger to the underside of a keg lid instead of reaching in with a sanitized hook. Cool. And it's easy, requiring only some silver solder, flux, a bit of stainless steel (preferably 316, food grade stainless) and a heavy duty soldering iron.

Step-by-Step

Begin with stainless scrap sheet stock of decent thickness. Cut a length to approximately 1" (25 mm) wide and 2" (50 mm) and be sure to file all the edges smooth. Drill a hole 1/2" (123 mm) on center from one end and bend the tab. That's your hanger.

To drill stainless you should use either cobalt or titanium drills. Start with a 1/8" or smaller drill and work your way up in several steps. Run your drill slowly and use cutting fluid.

Clean the underside of your keg lid, picking a spot midway between the purge valve and the lid's edge. (You don't want to melt the plastic valve, so remove it.) Apply several drops of flux. This cleans the keg lid chemically.

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Clean and flux the tab and apply heat from your soldering iron to the tab, pressing gently. When both pieces of metal are sufficiently heated, the solder will flow under the tab and form a void-free bond. I like silver soldering better than spot welding because it should make it impossible for any bacteria to hide under the tab as the two metal pieces become one.

To be honest, I cheated. My soldering iron would not provide sufficient heat. So, I preheated and tinned (applied a thin coating of silver solder) the tab. While the tab was hot from the torch, I applied the tab to the keg. I then applied the soldering iron, both as a way of holding the tab in place as well as heating, and heated the assembly a bit with the torch.

Next I applied the solder, flowing it beneath the tab. Do not apply solder when using a torch; the flame will melt solder and you'll get a "cold" or ineffective joint. Solder must flow. If it doesn't, cool and clean everything and start over. Once joined, clean the lid according to the directions that come with your flux. This is critical unless you like corrosive and poisonous chemicals in your beer. I used abrasive cleaner and hot water followed by a day-long soak in PBW.

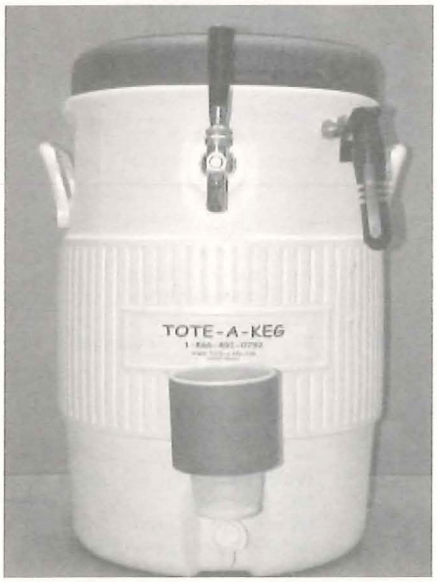
This was so simple I think I'll convert all my kegs. I never know when I'll want to dry hop or put a little more coriander and fresh orange peel into my beer. There's another benefit besides ease of retrieval — you can adjust hang-height to limit the time your addition stays in contact with the beer. By that I mean that tying the hop bag close to the lid. About 12–16 pints fo beer later, the hop bag will be hanging free of the beer, limiting contact time. In this way you can control the addition of flavors. ■

Thom Cannell writes the "Projects" column in every issue of BYO. He lives in Lansing. When he's not homebrewing, he writes about cars for a living.

Once the lid hanger is welded to the lid, it will need to be cleaned off.

Once the weld is cleaned, the pressure valve can be reinstalled.

DRAFT BEER ON THE GO!



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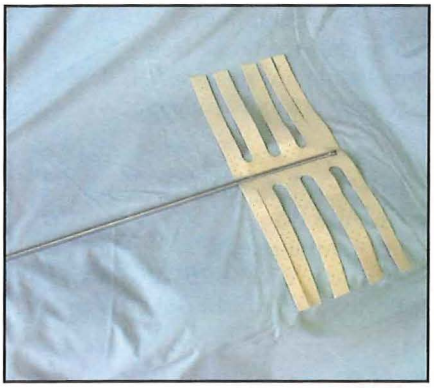


CARBOY SCRUBBER

A&M Manufacturing recently introduced the Carboy Power Scrubber, a new product that quickly cleans carboys. A&M launched this product to the U.S. homebrewing and market in March and a number of distributors are now beginning to carry it.

The Scrubber addresses a common problem: how to quickly and effectively clean glass carboys. Homebrewers can simply attach the Scrubber to a power drill, insert it into a carboy with cleaning solution or water, and then let the drill do the work. The Scrubber completes the job in moments, including tough-to-reach areas. After rinsing, the carboy is then ready for the next batch. This new device, made with a stainless-steel frame and soft scrubbing material, removes the frustration of manual scrubbing with brushes.

A&M Manufacturing manufactures various products to assist with homebrewing and winemaking. For more information, contact Mary Meredith at mmeredith@carboyscrubber.com or (814) 591-0808 (or check out www.carboyscrubber.com).

HOMEBREW LABELS

Check out the latest beer-label styles at Myownlabels.com. The new styles feature antique German motifs, like Prussian and Hesse, or you can choose among a wide selection of other custom labels. The beer labels come in oval, rectangular and collar shapes on sheets of 6, 8 and 18 labels respectively. There is no minimum order, so you get only as many sheets as you need. Go to www.myownlabels. com.

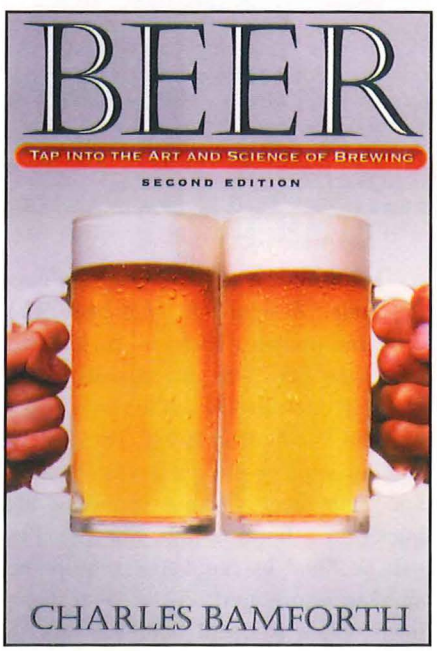
BEER BOOKS

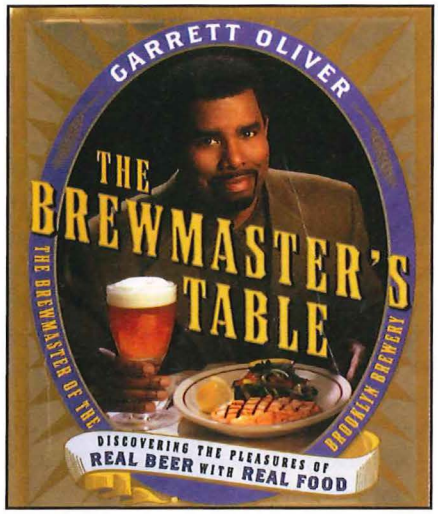
"Beer: Tap Into the Art and Science of Brewing" (Second Edition) by Dr. Charles Bamforth is great for domestic home-brewers, microbreweries, and beer connoisseurs alike. Dr. Bamforth, who has been described as "one of the leading brewing scientists of his generation," is the Anheuser-Busch Endowed Professor of Malting and Brewing Science at the University of California, Davis.

In the revised and updated version of his definitive guide to brewing, Bamforth traces the history of beer from ancient Babylon to today's brewing science, recounting important brewing milestones along the way. This new edition contains expansive coverage of global beer styles throughout the world, the sensory character of beer flavor, and the development of the global brewing industry. Each of the staples of brewing (barley, hops, water, and yeast), the fundamental processes of brewing (mashing, boiling, fermentation, maturation, and packaging), and the quality determinants (flavor, foam, color, and clarity) is covered in comprehensive detail. Never losing sight of the central role of science in beer's design and manufacture, Bamforth closes with some predictions about the future of the industry.

Ideal for the beer lover, amateur brewer, hobbyist, and undergraduate alike, "The Art and Science of Brewing Beer" is the ideal one-volume handbook on brewing beer. The book retails for $35 (hardcover) is can be bought or ordered at your favorite bookstore.

Garrett Oliver, brewmaster at the award-winning Brooklyn Brewery, is the author of **"The Brewmaster's Table: Discovering the Pleasures of Real Beer With Real Food"** (Ecco, an imprint of HarperCollins). In this informative tour of the world's most savory breweries, the book leads readers through an entertaining account of more than 50





distinct styles of beer from around the world. Along the way, he illustrates the art of pairing beer with food. "Real beer is to mass-market beer like store-bought Wonder bread is to fresh-baked bread," says Oliver. "Real beers have an incredible range of flavors — all of which, when appropriately matched, make for a perfect complement to specific dishes." The book retails for $29.95 (hardcover) and can be bought through your local bookstore.

BEER IN A BAG

Incan Brew Beer-In-A-Bag is a new foil pouch designed to hold beer. The reusable pouches come in 16, 22 and 64 ounce sizes and are already being used by microbreweries across Alaska and the Pacific Northwest. The pouches offer smaller micros a way to package their beer without spending big bucks on a bottling line. The pouches can be filled by hand and require no special equipment. They also have been tested by local homebrewers. A zip-lock seal holds the carbonation, making the package re-usable for hobbyists. Plus, the pouch is a great way to bring some beer on your next camping trip. For information, call Yukon Spirits at (907) 569-3800 or go to http://incanpouch.tripod.com.

YEAST STRAINS

White Labs (www.whitelabs.com) has changed its "platinum" series for the homebrewer. The following platinum strains will become part of the regular line and will be available all year:

WLP570: Belgian Golden Ale
WLP013: London Ale
WLP802: Czech Budejovice Lager
WLP920: Old Bavarian Lager

The platinum strains for the remainder of 2003 are:

July-August
WLP885: Zurich Lager
WLP410: Belgian Wit II
September-October
WLP833: German Bock (new)
WLP006: Bedford British
November-December
WLP025: Southwold Ale
WLP099: Super High Gravity

THE BEER DECK

With tips on selecting, serving and (of course) drinking all kinds of beer, "The Beer Deck" is a handy reference guide for all beer lovers. Each section features a different style of beer, from wheat beers to British ales and Belgians. The Beer Deck sells for $13.95 and is published by Chronicle Books (www.chroniclebooks.com). ■

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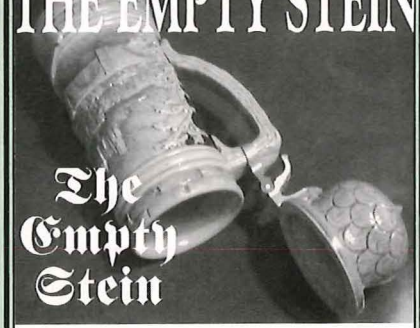

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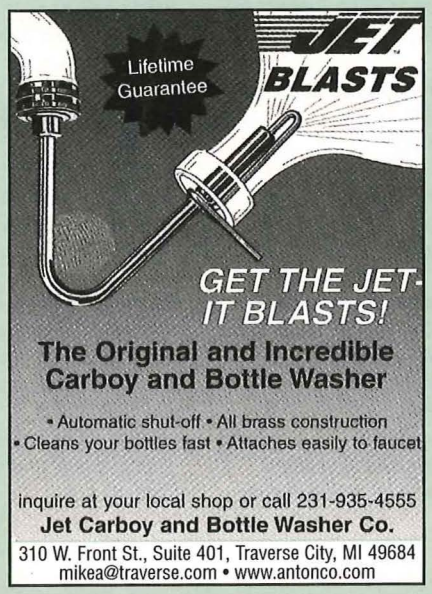

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Lounge Life

It's more than a hobby, dammit!

by Sam Piper

Sam Piper is a regular contributor to Brew Your Own. He recently opened The QueensLand Lounge in his living room. Naturally, we sent a reporter to interview Piper live at the big event.

BYO: *So, Sam, you've got a permanent pub in the add-on room behind your house, is that right?*

Piper: Yes, the Smiling Dog Pub.

BYO: *And now you've transformed your living room into a hotel lounge?*

Piper: The QueensLand Lounge. I think the Smiling Dog Pub and the QueensLand Lounge are the next logical extension of the fabulous hobby of homebrewing.

BYO: *Perhaps your dictionary differs from ours. Why do say this is a logical extension?*

Piper: I have a couple of questions for any serious brewer. Where do you intend to go with your homebrewing hobby? What are your goals? Or maybe a better question to ask is, where do you intend to stop? Me, I wanted to go all the way.

BYO: *So why didn't your open a brewpub or start a microbrewery?*

Piper: Because that's work. I want to keep beer a hobby, in the world of play. "Vocation" is what you do for work; an avocation, a hobby, is what you do for fun, relaxation. Look it up.

BYO: *So you do have a dictionary. Good for you. But couldn't brewing be both a vocation and an avocation?*

Piper: I've talked to a lot of homebrewers who went pro, and every one said it was a great way to lose their hobby. I don't want to do that. But I do want everything that goes with a pub — a bar, tables, guests and entertaining. I love to entertain and I love to share my beer. So I made my own damn pub.

BYO: *So how long has the pub been open?*

Piper: The Smiling Dog has been going strong for eight years now.

BYO: *No, I meant how long has it been open today. I'm thirsty.*

Piper: Uh, it's only noon.

BYO: *Oh, okay . . . so we don't you tell me a little more about the Smiling Duck Pub. Or .. sorry. Smiling Dog.*

Piper: I started with a bar I made from a closet door. My son Josh made the pub sign that I still have; a designer at work made my logo. When I moved here and had a permanent room for it, I bought a used bar. It didn't fit the room and was mostly trashed, but it had a great brass rail. That bar sufficed for a couple of years, but was too high for my chairs or even to stand at. Over time, my friends and guests have given me most of my decorations. This absolutely beautiful bar — the centerpiece of the Smiling Dog Pub — was made by my friend Rick Olson, a master at cabinetry. The bar is made of teak and birch, designed just for this pub, and it sports the brass rail from the previous bar. Rick's bar creation is easily the nicest piece of furniture I'll ever own.

BYO: *You mean all this stuff was given to you?*

Piper: I bought the remaining furniture, the tables and stools. Everything else, yeah. The pictures, mugs, bar towels, bar signs . . . all of it. People love to participate.

BYO: *You're very fortunate.*

Piper: Yes, I have wonderful friends.

BYO: *No, I mean you're fortunate that I'm not wearing my cargo pants or I'd be going home with some of this stuff. Anyhoo, isn't all this a bit extreme?*

Piper: I'm interested in the concept of "scale" within a hobby. I did a little thinking on this subject and I came to the conclusion that much of what passes for advanced homebrewing has become stalled at the point of style development. I call this the "what" and "how" part of the hobby — the "what do you make" and "how do you make it" part. That's fine, and we all have to get there, but I don't see what and how as the culmination of homebrewing. I think that once one excels at making beer, one needs to tackle the "why." One needs to ask why we have beer.

BYO: *Okay, I'll bite, why?*

Piper: Beer is a social lubricant. It helps people talk, bond and deal with the day. Why does beer exist and why does every culture have it? I would argue that beer is a social beverage, best consumed in the context of friends and society. Even more, I would argue that beer is better in a pub than anywhere else, for what is a pub but a place designed for friends to get together and have a pint? ■

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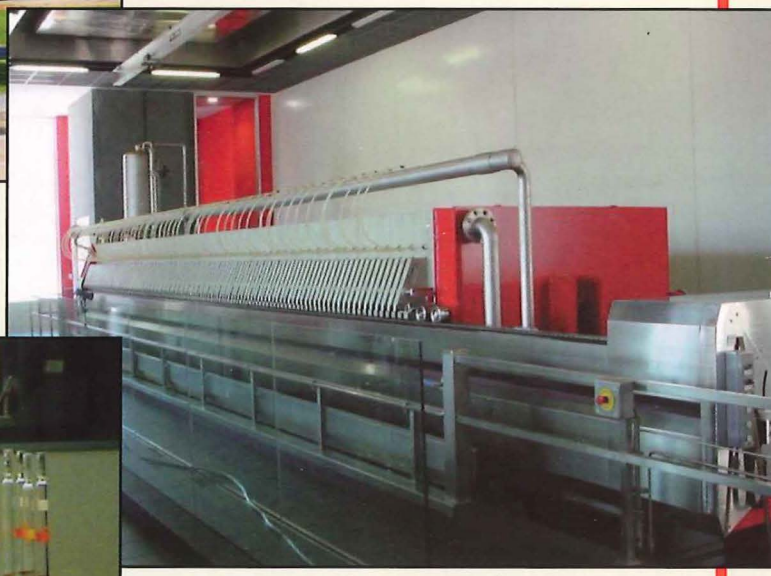

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