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THE HOW-TO HOMEBREW BEER MAGAZINE

MARCH-APRIL 2009, VOL.15, NO.2

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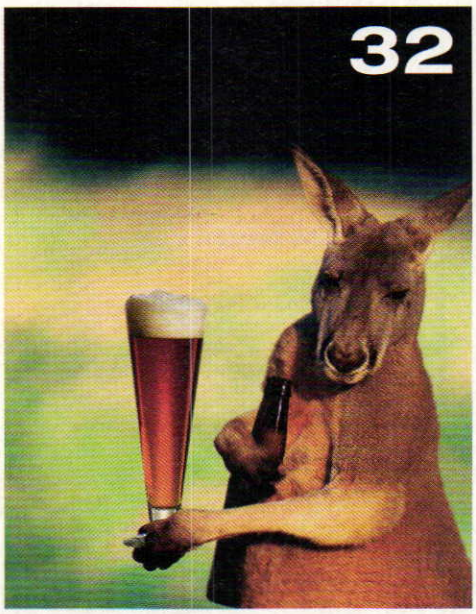
MARCH-APRIL 2009
Volume 15 Number 2

Features



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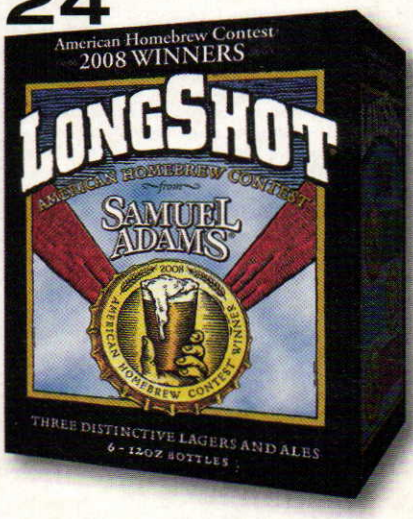

Where to find it

Departments

RECIPE INDEX

BYO RECIPE STANDARDIZATION

Extract efficiency: *65%*
(i.e. — 1 pound of 2-row malt, which has a potential extract value of 1.037 in one gallon of water, would yield a wort of 1.024.)

Extract values for malt extract:
liquid malt extract (LME) = 1.033–1.037
dried malt extract (DME) = 1.045

Potential extract for grains:
2-row base malts = 1.037–1.038
wheat malt = 1.037
6-row base malts = 1.035
Munich malt = 1.035
Vienna malt = 1.035
crystal malts = 1.033–1.035
chocolate malts = 1.034
dark roasted grains = 1.024–1.026
flaked maize and rice = 1.037–1.038

Hops:
We calculate IBUs based on 25% hop utilization for a one hour boil of hop pellets at specific gravities less than 1.050.

Brew Your Own
THE HOW-TO HOMEBREW BEER MAGAZINE

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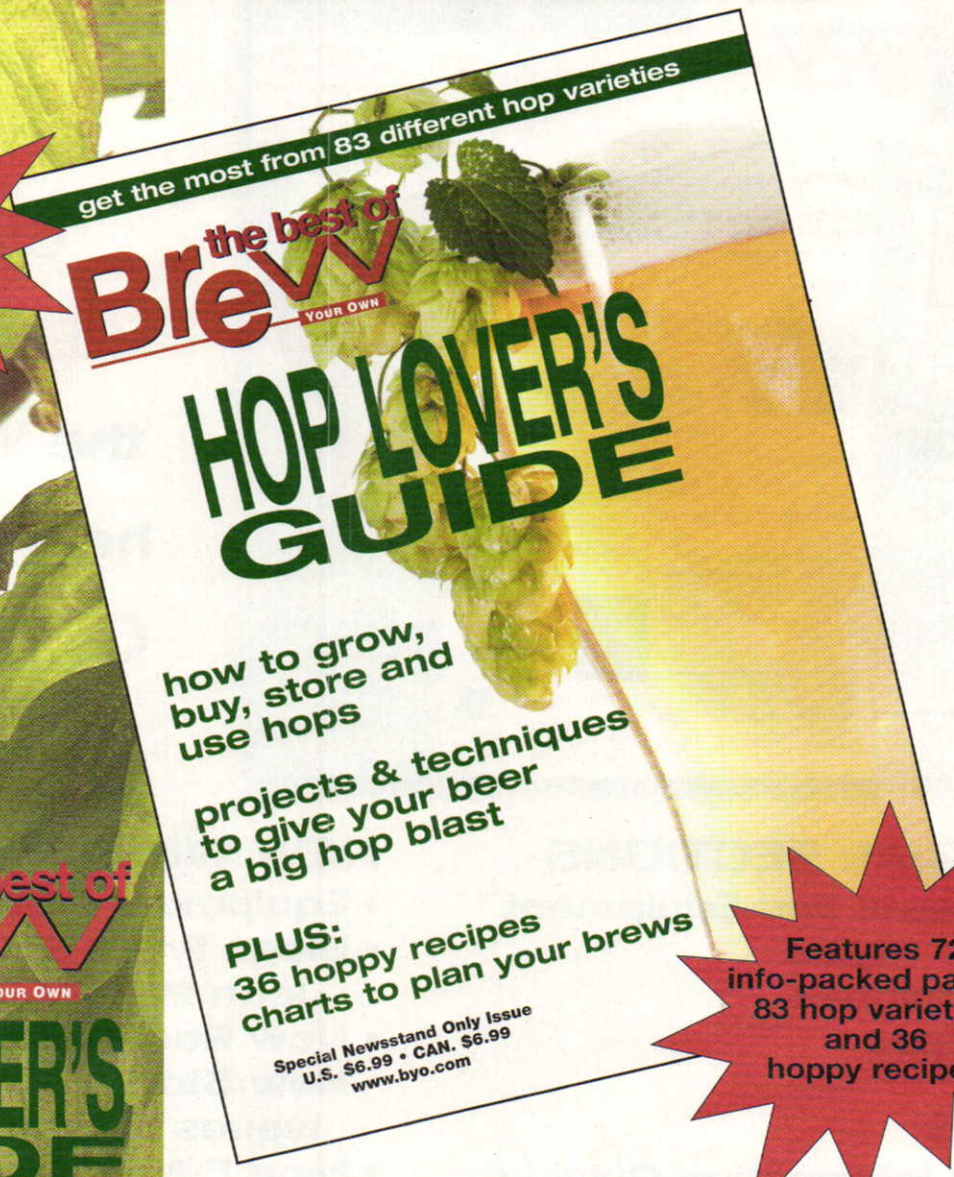

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Mail

Attenuating a Stone Clone

Thanks for the great article on Stone Brewing (in the December 2008 issue of BYO). After reading it, I tried my first Ruination IPA. Wow! I'll definitely be brewing up a batch from your Stone clone recipe. My question is this: Stone recommends White Labs WLP002 or Wyeast's 1968 in clone versions of their brews. While the flavor profile may mimic the character their beers are said to exhibit, wouldn't both of these yeasts be too low in their attenuation levels? Even the White Labs WLP005 strain seems too low at around 74% attenuation.

Stone's IPA and Ruination both hit around 81–83% attenuation according to the Stone clone recipes. Wouldn't White Labs WLP007 (Dry English Ale) yeast be more appropriate? White Labs' pamphlet states that 007 resembles 002 in its flavor profile, but has the ability to ferment about 10% higher than the 002 strain at around 80%. Sounds like the Dry English Ale yeast would be similar to the WLP001 (California Ale) yeast in its attenuation, but fuller in its ester profile. While I'm no renowned craft brewer, I just want to brew the best possible all-grain version of Ruination that I can.

Greg Bruen
via email

Great question. When a commercial brewery uses a proprietary strain of yeast, as Stone does, home clonebrewers are forced to look for an acceptable substitute. This involves two key variables, flavor profile and attenuation. Unfortunately, there is not always a yeast strain that matches both of these criteria. Luckily, however, actual attenuation is influenced by pitching rate, aeration levels, mash regime and ingredient fermentability as well as the yeast strain. By manipulating one or more of these, you can achieve a higher or lower attenuation. (And of course, pitching rate and aeration levels also influence the flavor a yeast strain lends to a beer.) With the starter sizes recommended in the recipes and a healthy amount of aeration, you should get higher attenuation from the WLP002/Wyeast 1968 strain than the printed specs indicate (although probably not quite as high as Stone's yeast).

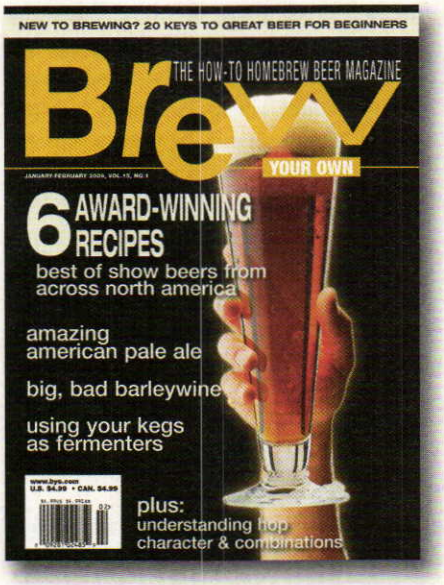
Both of the yeast strains you mention would also likely work as a substitute. (So might Wyeast's 1187 (Ringwood Ale) yeast, if you let the beer sit on the yeast long enough to take care of any residual diacetyl.) Each has a slightly different fermentation profile, but all are in the same ballpark of Stone's.

If you really want to hit the target final gravity (FG) exactly, you could also rely on the fact that simple sugars are 100% fermentable and swap some sugar for some of the grain in the recipe. If you know the attenuation you expect from your yeast, dial down the pale malt in your recipe until you hit the proper calculated final gravity (FG). Then, add cane or corn sugar to reach the appropriate original gravity (OG).

Another possibility — admittedly untested on these clones — would be to co-pitch the White Labs WLP002 or Wyeast 1968 with a small amount of a highly-attenuative, but "neutral" yeast strain, such as White Labs WLP001 (California Ale) or Wyeast 1056 (American Ale) yeast. The English strain would provide a reasonable match to Stone's flavor profile while the "clean," attenuative strain would knock a few gravity points off the final gravity (FG).

Finally, several readers pointed out a typo in the Ruination recipe. The recipe calls for "22.0 oz. (57 g)" of dry hops. The weight in grams is correct, but the weight in ounces should be 2.0. Sorry for any confusion that might have caused.

Good luck with your Ruination clone.



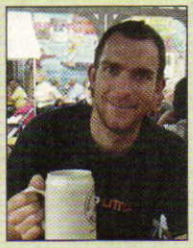
Device by Dogfish

Hello BYO. The story on the Randall-esque hopping device in your December 2008 issue recently came to our attention. We commend all breweries, professional and home, for flying their freakflags, tweaking recipes, equipment, and tech-

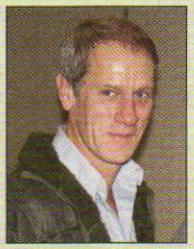
Contributors

ANDY SPARKS has been a homebrewer for 17 years. In 1993 he went pro with his passion and opened a homebrew shop called The Home Brewery in Fayetteville, Arkansas (visit the shop online at TheHomeBrewery.com). An avid collector of great beers, Andy hasn't met a hop he didn't like. He appears regularly on Basic Brewing Radio and Basic Brewing Video.

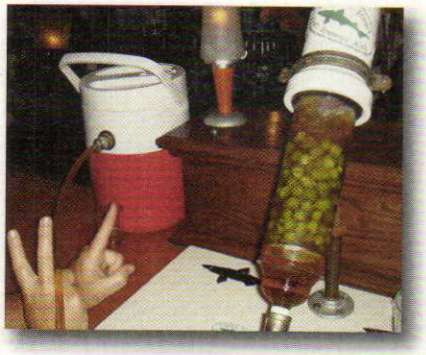
Andy makes his BYO writing debut in this issue with a "Projects" article about building a handy home hop trellis that not only eliminates climbing ladders — it's also aesthetically pleasing to the eye. Read it on page 69.



LACHLAN STRONG says his interest in commercial beer led to an interest in homebrewing, which in turn fed the obsession with commercial beer. His obsession with lambic and gueuze must now compete with Franconian and Czech lagers . . . and anything and everything else. Homebrewing helps him pass the time between painfully infrequent visits to breweries and bars around Australia and the world, and thinking about beer helps pass the time when he isn't drinking it. Lachlan lives in Melbourne, is a member of the Inner Circle Brewers and was an organizer of the inaugural Australian National Homebrewing Conference. On page 34 of this issue, he discusses the beer scene in Australia.



TONY WHEELER, from Melbourne, Australia, says, "Like most Aussie blokes of my vintage, I experimented with a few kit and kilo batches back in the dark ages of the early 1980s." Twenty years later, he all-grain brews. He joined the Melbourne Brewers club, "to practice the black arts of mashing and sparging with fellow worshippers." He is also interested in beer styles and on page 40, he discusses the indigenous Australian style, Australian Pale Ale inspired by Cooper's Sparkling Ale.



niques to explore the outer edges of what great beer can be. However, everyone at Dogfish Head was a little bummed that the only thing that was said in your story about our pal Randall was that he didn't work well. We got no credit for coming up with the original equipment and concept of real-time hopping. Even the term "organoleptic hop transducing module" came directly from us. Dogfish Head has made and sold over 200 Randall the Enamel Animals and we only charge our cost for building them. We don't make a profit and we don't tell people they only work with Dogfish Head beer because we want beer lovers to experience first-hand the way a nice jolt of whole hops can change the flavor and aroma of a beer. We have attached a picture of Randall 3.0, our current model which works well with different beer-enhancing herbs, spices, fruits, in addition to using hops. As with previous versions, the foaming that your story referred to mostly occurs as a result of hooking the device up AFTER instead of BEFORE a cold-plate or cooling device. Thanks for turning more and more people on to the world of better beer.

Sam Calagione
President, Dogfish Head Craft Brewery
Rehoboth Beach, Delaware

The Hopinator story was a follow-up to a multi-tap bar project article in the November 2008 issue. In that article, we did credit Dogfish Head as the original source for the idea as well as the name Randall. We should, however, have repeated this information in the second part of the article in the December 2008 issue.

We look forward to seeing a Randall 3.0 at a brewpub or taphouse near us soon.

Mocha Mill?

Is it OK to use a coffee grinder instead of a grain mill?

Philip Camillocci
via email

A coffee grinder will not give you a good crush for brewing. Most homebrew shops will grind your grain for you on request. Or, you can invest in a homebrew-sized grain mill.

Questions, concerns, comments?

Contact us!

Brew Your Own — The How-To Homebrew Beer Magazine

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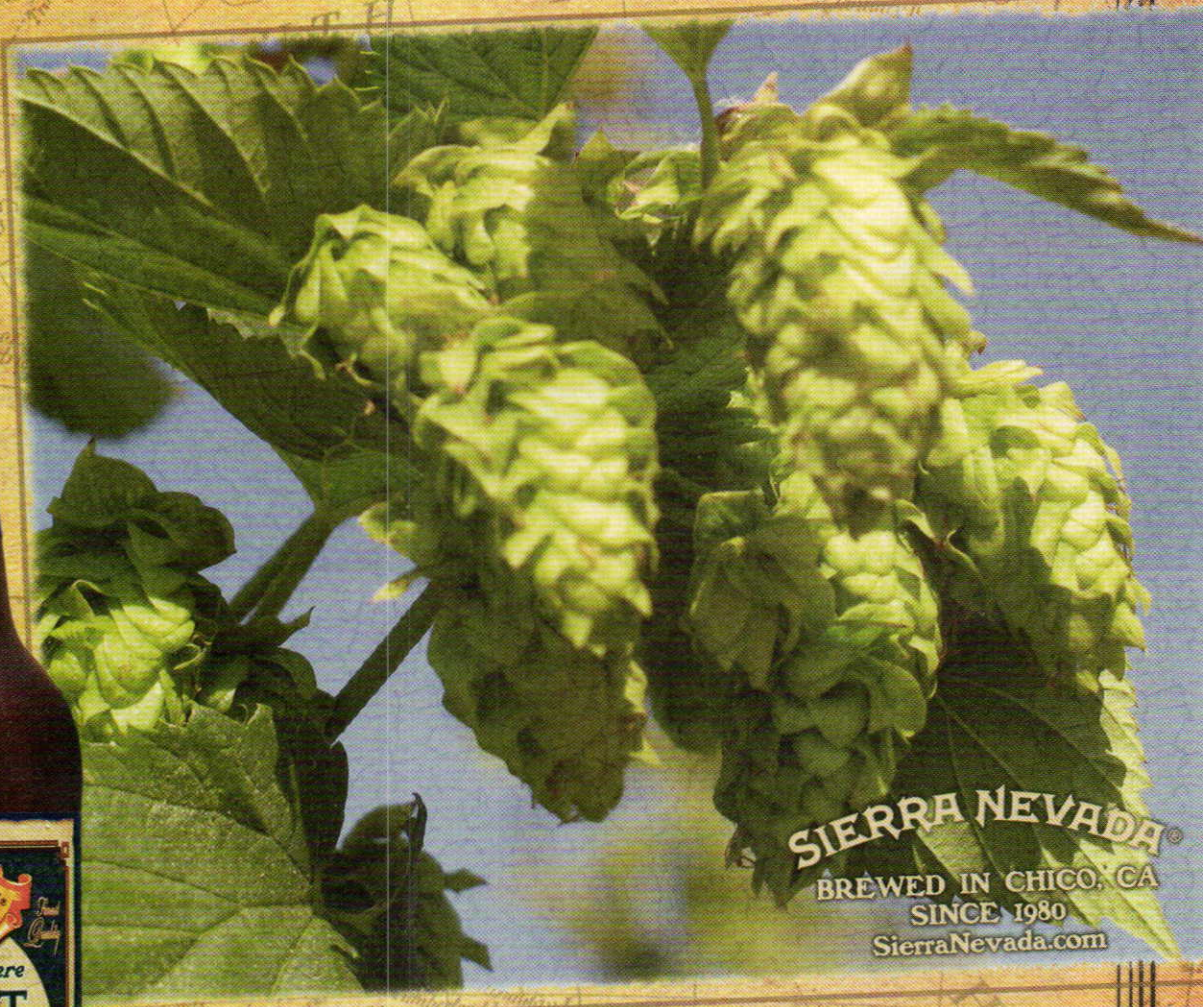
Southern Hemisphere HARVEST Fresh Hop Ale



As a pioneer of wet-hop ales, we fell in love with the flavor of fresh hops. Each fall, we look forward to harvest time, but in the past, harvest was limited to nature's brief window. It occurred to us that we could get hops at another time of the year; look to the Southern Hemisphere, where the growing season is a mirror image of our own. We traveled to New Zealand to select the first fresh hops, and shipped them to the brewery within the week they were picked. We hope you enjoy these unique southern hops and we hope to keep the love affair going all year-round.

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homebrew NATION

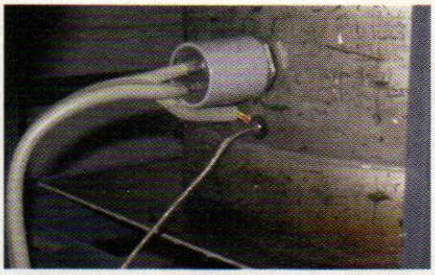
BYO

homebrew systems that make you DROOL

Rob Welniak
Plainfield, Indiana

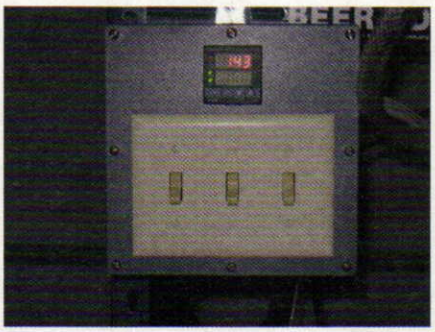
My system is an ongoing evolution from a simple 5-gallon (19-L) Rubbermaid all-grain system that I used in my kitchen, with water heated on the stove to an all-electric HERMS that utilizes 10-gallon (38-L) Rubbermaid coolers and a 15.5-gallon (59-L) Sankey keg for the boil kettle.

My design philosophy is simplicity, efficiency, affordability and repeatability. I built my own bulkheads and through-the-wall thermometers for affordability and reliability. When possible I sourced components to build items in lieu of buying commercial components.

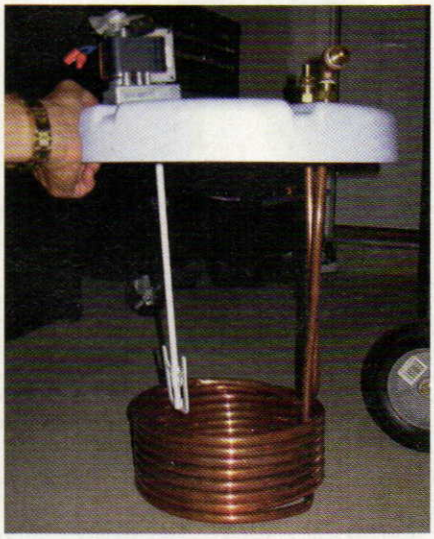


My boil kettle is a 15.5-gallon (59-L) (legal) Sankey keg that has been converted to an E-Keggle. It is outfitted with a ½" ball valve, custom pick-up tube, 5500W ULWD heating element and thermocouple.

All of the components are powered through a custom 240VAC control panel that I built.



The panel also contains switched outlets for the HLT and March 809 pump. It also contains a "kill" switch that will kill both legs of power to the E-Keggle heating element regardless of the PID and SSR command.



The HLT HEX contains 25' of ½" copper tubing (a modified pre-chiller) that is outfitted with brass QDs. It also sports a custom through-the-wall digital thermometer.

The control panel consists of a PID and SSR for the E-Keggle heating control.

10-gallon (38-L) Rubbermaid beverage cooler converted to HERMS HEX with a ½" ball valve bulkhead.

The HLT has a 1500W 120VAC heating element controlled by a Johnson A419 controller that is mounted to the cooler itself.

club PROFILE
Barossa Brewers Club
Barossa Valley, South Australia

The Barossa Brewers know that making good wine takes a lot of good beer.

Why a Brew Club In International Wine Country ?

The Barossa Brewers Club (BBC) is the only brew club in Australia's internationally famous wine region called the Barossa Valley. A great percentage of our members work in the wine industry and can attest to the saying, "It takes a lot of good beer to make good wine."

Our member Don Young is a senior white winemaker at Orlando Wines in South Australia, and he says that, "it takes considerable energy and focus to make great wines and typically the winemaker's solace and sustenance is in drinking high quality beer — and the best quality beer is a homebrewed beer made by our local artisan homebrewers."

In keeping with this principle, the Barossa Valley now has two microbreweries: Barossa Valley Brewing in Lyndoch, makers of Bee Sting, and Barossa Brewing Company in Greenock, famous for their Miller's Wheat. A third microbrewery has just received final planning permission to start building.

It isn't hard to see the parallels between the philosophy of winemaking and homebrewing. In both you're trying to capture and harness the flavors from your ingredients to the best of your ability and craft a drink in a particular style. With wine it is all about grapes, skins, oak and yeast. With beer it is all about malt, hops, adjuncts, yeasts, bacteria, fruit, spices, oak, etc. depending on what beer you are making. One of the best things about being a homebrew artisan is that the spectrum of beer styles far outweighs the options for winemakers, so we have a lot more freedom and scope to play with when making beer. And also, beers are ready to drink a lot earlier than wines — more drinking time!

We have watched the brew club that started five years ago with three people grow to approximately 25 members with a e-mail list of more than 35. The BBC is a social co-op that promotes good fellowship, good brewing and good beer. We meet on the first Friday night of the month, taking turns at members' houses where we freely sample advice, beer and a lot of banter.

The club is also involved in brewery tours, we conduct tasting and style nights and promote the hobby of brewing by getting involved in local homebrew competitions as well as offering homebrewing lessons as a fundraiser and giving brewing demonstrations. We cater to all forms of brewing — from kits to all-grain. Everyone is welcome to the addiction. The club has had a lot of success in homebrew competitions including South Australian state championships, the Australian National Wine and Beer Show and at local shows. Most members are also members of Australia's homebrew forum at www.aussiehomebrewer.com.

reader RECIPE
Kurt Seelenmayer
Waterdown, Ontario

(Left to right) Kurt Seelenmayer, Ed Koren, Louis DeBourbon, Kevin Tighe and Ian Johnson celebrate at the 2008 GCHC.

Hefe Weizenheimer
(5 gallons/ 19 L, all-grain)

OG = 1.051 FG = 1.015

IBU = 17 SRM = 6 ABV = 4.6%

Kurt's recipe won the 2008 Great Canadian Homebrew Competition (GCHC) top honors for Best in Show, First German Wheat Beer and Denison's Weissbeer Look-alike.

Ingredients

6.26 lbs. (2.84 kg) Weyermann pale wheat malt

3.41 lbs. (1.55 kg) Canadian 2-row pale malt

2.55 AAU Tettnanger hops (0.85 oz./24g at 3.0% alpha acids) (120 min.)

1.2 AAU Tettnanger (0.40 oz./11.3g at 3.0% alpha acids) (60 min.)

1.2 AAU Tettnanger (0.40 oz./11.3 g at 3.0% AA) (15 min.)

White Labs WLP380 (Hefeweizen IV) or Wyeast 3333 (German Wheat). Use a sufficient size yeast starter 1–2 days prior to pitching.

Step by Step

Mash schedule (3 hours total): Mash in with 2.95 gallons (11.2 L) water to rest at 122 °F (50 °C). After 45 minutes pull a 3.7 quart (3.5 L) decoction and heat to reach boiling after 15 minutes. Boil for 10 minutes, and return to mash (at 70 minutes into the mash schedule). Mash will be at 149 °F (65 °C); rest for 20 minutes before pulling a second 2.25 quart (2.13 L) decoction. Heat decoction over 10 minutes to boiling, and boil for 10 minutes. Return to main mash (at 110 minutes into mash schedule) for a 156 °F (69 °C) rest. After 10 minutes, raise mash to 162 °F (72 °C), and rest for 1 hour. Mash out at 167 °F (75 °C), and sparge with 172 °F (78 °C) water.

Collect 8 gallons (30 L) total with a pre-boil gravity 1.037. Boil for 120 minutes, adding hops as indicated above. Chill. Draw 1 quart (1 L) of green beer (for priming) into sanitized container and store in fridge, along with 2.5 fl oz (74 mL) of stirred yeast starter. Oxygenate and pitch remaining yeast starter. Ferment six days at 62–68 °F (17–20 °C) and check gravity; bottle (I didn't do a secondary fermentation). Add saved green beer and yeast starter to bottling bucket as priming agent. Bottle condition for 2–8 weeks; tastes best when fresh (during first 10–12 weeks).

byo.com BREW POLL

How important is saving money when you're homebrewing?

I'll splurge sometimes, but I stick to a budget
39%

I go overboard often, but I'm trying to spend less
32%

I pinch every brewing penny
16%

Money means nothing when it comes to brewing
13%

Check out the latest poll question and vote today at byo.com

replicator
by **Marc Martin**

Dear Replicator,

I have been homebrewing for eight years and love your magazine. It's a welcome diversion from my job in nuclear facility certification. This summer I was sent to inspect one of the country's largest operations in Richland, Washington. I wasn't expecting to find much in the way of good beers but was pleasantly surprised to locate three brewpubs in the suburbs. My favorite was Ice Harbor Brewing in Kennewick. All five of their standard beers were excellent, but my favorite was their Runaway Red Ale. I am hoping that you can get some details on how I can replicate this wonderful beer.

David Holskamp
Bethesda, Maryland

A group of three towns known as the "Tri-cities" are located in south central Washington State. This area is home to the famous Hanford nuclear facility. For beer connoisseurs it is also home to Ice Harbor Brewing, named after a harbor on the Columbia River where paddle wheel steamers would tie up in the winter. This brewery is rapidly gaining fame for producing some of the best beers in this part of the state. Your recipe request put the Replicator back on the road to personally see why they are collecting so many laurels.

I was fortunate enough to arrive at the brewery on the Thursday evening that coincided with their local homebrew club meeting and was greeted by one of the two owners, Bill Jaquish. Bill and Mike Hall purchased the brewery in October of 1996 from Dave Maheen. It had been in operation for two years prior and Dave was going to concentrate full time on manufacturing beer bottling equipment.

This is truly a brewery that has its roots deeply seated in homebrewing. Mike Hall had been president of the local club, Mid Columbia Zymurgy Association (MCZA), and Bill was one of their key members. Now, 12 years later, they continue to be very supportive of homebrewing. In 2000 they added a homebrew supply store, plus they host MCZA's monthly meetings and even allow the creation of a club "Megabrew" where club members use the brewery's equipment.

The original location can best be described as "warehouse industrial" with major east-west train tracks right behind. Whenever a train roars by, rattling the building, a server will spin the "pint price wheel" to establish prices until the next train. The 10-barrel brewhouse is largely made up of converted dairy vessels proving you don't have to have fancy equipment to create great beers. During the early years Bill and Mike were heavily involved with the brewing. For the past six years, Russ Corey, also a former homebrewer, has been working his magic with those vessels.

While joining the MCZA club meeting I had the pleasure of sampling the Runaway Red Ale. The name is inspired by those same trains that vibrate the mugs and glasses. An upper end version of an American Amber, it has a caramel punch that hits you like a locomotive. The Cascade hops provide a welcome bitterness and balance while the two aroma hop additions create a somewhat spicy nose. Bill tells me that this beer has evolved somewhat over the years with the bitterness being more subdued now, and homebrewers may want to experiment with increasing those Cascades.

Now David, far easier than nuclear fission, you can "Brew Your Own" Runaway Red Ale. For further information about the brewery and their other fine beers visit the Web site www.iceharbor.com or call them at 509-582-5340.

Ice Harbor Brewing Runaway Red Ale
(5 gallons/ 19 L extract with grain)

OG = 1.052 FG = 1.010
IBUs = 26 SRM = 15 ABV = 5.5 %

Ingredients
3.3 lbs. (1.5 kg) Muntons light, unhopped, liquid malt extract
2 lbs. (0.9 kg.) light, dried malt extract
22 oz. (0.62 kg) crystal malt (80 °L)
6 oz. (170 g) carastan malt
6 oz. (170 g) cara-pils malt
6.6 AAU Cascade pellet hops (60 min.) (1.2 oz./34 g of 5.5% alpha acid)
1.25 AAU Willamette pellet hops (3 min.) (0.25 oz./7 g of 5% alpha acid)
2.4 AAU Tetnanger pellet hops (3 min.) (0.25 oz./7 g of 4.8% alpha acid)
½ tsp. Irish moss (last 15 minutes of the boil)
White Labs WLP 001 (American Ale) or Wyeast 1056 (American Ale) yeast
0.75 cup (150 g) of corn sugar for priming (if bottling)

Step by Step
Steep the crushed grain in 2 gallons (7.6 L) of water at 152 °F (67 °C) for 30 minutes. Remove grains from the wort and rinse with 2 quarts (1.9 L) of hot water. Add the liquid and dry malt extracts and bring to a boil. While boiling, add the hops and Irish moss as per the schedule. During the boil, use this time to thoroughly sanitize a fermenter. Now add the wort to 2 gallons (7.6 L) of cold water in the sanitized fermenter and top off with cold water up to 5 gallons (19 L).

Cool the wort to 75 °F (24 °C). Pitch your yeast and aerate the wort heavily. Allow the beer to cool to 68 °F (20 °C). Hold at that temperature until fermentation is complete. Transfer to a carboy, avoiding any splashing to prevent aerating the beer. Let the beer condition for one week and then bottle or keg. Allow to carbonate and age for two weeks and enjoy your Runaway Red Ale.

All-grain option:
This is a single step infusion mash. Replace the malt syrup and dry extract with 9 lbs. (4.1 kg) 2-row pale malt. Mix the crushed grain with 3.5 gallons (13 L) of 170 °F (77 °C) water to stabilize at 152 °F (67 °C) for 60 minutes. Sparge slowly with 175 °F (79 °C) water. Collect approximately 6 gallons (23 L) of wort runoff to boil for 60 minutes. Reduce the 60 minute hop addition to 1 oz. (28 g) to allow for the higher utilization factor of a full wort boil. The remainder of this recipe and procedures are the same as the extract with grain recipe.

Homebrew CALENDAR

March 7
Cincinnati, Ohio
Cincinnati Brewfest
A homebrewing bock-only competition to be held at Bockfest Hall in downtown Cincinnati as part of the weekend-long celebration of all things bock. The Christian Moerlein brewing company will select one entry from the Traditional Bock (5B) category to be used as the recipe for the 2010 Hudepohl Bock release. Entry deadline is Friday, February 27. $6 for the first entry and $4 for additional entries. More information and online registration available at http://www.bloatarian.org/

March 14
Raleigh, North Carolina
Shamrock Open Competition
A BJCP-sanctioned annual homebrew competition organized by the CARBOY homebrew club. Registration is open from January 31 through February 28. Entries will be accepted in all beer categories listed for the BJCP Style Guidelines (Categories 1-23). Only one entry per subcategory will be accepted. $6 for each entry up to 8 entries; $9 for each entry above 8 entries. Rules, dropoff locations and information available at http://www.hbd.org/carboy/shamrock.htm.

March 28
Berkeley, California
2009 World Cup of Beer
The 14th annual homebrew competition organized by the Bay Area Mashers homebrew club. Deadline is March 14. Judging includes all styles and substyles of beer in BJCP categories 1 through 19 and 22. Join the Mashers for a party at the Trumer Brauerei in Berkeley following the judging. More info at http://www.bayareamashers.org/WCHome.htm.

April 25
Londonderry, New Hampshire
Mead Free or Die
A mead-only BJCP & AHA Registered event using the 2008 BJCP style guidelines. Entries must be received between April 1 and 19. $6 per entry. Entries cannot have been brewed on equipment used to brew beverages for any commercial purpose. More information and online-only registration available online at http://nhbrewers.com/meadfreeordie/.

BEGINNER'S block

Your First Lager

by Betsy Parks

Ales are often the first choice for beginning homebrewers as they are easier to brew and maintain fermentation temperatures, quicker to ferment (a.k.a. faster to drink) and require less equipment to brew. Eventually, however, lager curiosity can take over. Take the time to digest the key principles for making lager and you will have the best chances for success.

Yeast

The first main difference between brewing an ale and a lager is the yeast. Lager yeasts ferment at lower temperatures than ale yeasts and produce less fruity esters to produce beers that are "cleaner" in flavor such as helles, pale lager or Pilsener. They can also produce more sulfur compounds than ale yeasts. In his book *How to Brew*, author John Palmer writes that many first-time lager brewers mistakenly dump their lagers because of the sulfur smells. Don't toss that batch, however. During the conditioning period, the aromas leave the beer by dissolving into the headspace.

When brewing a lager, remember that because the yeast ferments at a lower temperature, causing the yeast to be less active, you should pitch more yeast than you would for an ale. A good pitching rate target is around 10 million cells/mL. For more information about specific lager yeasts, visit BYO's online yeast chart at: byo.com/resources/yeast.

Fermentation

Lager yeasts ferment at colder temperatures than ale yeasts, typically in the 45 to 55 °F (7 to 13 °C) range during primary fermentation. Because of these lower temperatures, primary fermentation takes generally twice as long as ale fermentation depending on the recipe and the yeast you choose. Cooler temperatures also prevent the yeast from developing any fruity esters while the yeast consumes any residual sugars. The challenge to brewing lagers, however, is achieving these temperatures and maintaining them throughout fermentation and during the lagering process.

Temperature control

Not everyone lives in a climate with lager-friendly temperatures, and even if they do there is no guarantee that the temperature will remain consistent throughout fermentation. Once the fermentation period is finished, there is also the conditioning period called lagering, which requires keeping the beer at a cool temperature for a lengthy period — sometimes as long as a few months. To maintain these temperatures you can try brewing lagers only during the cooler months of the year or try techniques such as evaporative cooling. You can also invest in some extra brewing equipment such as a recirculating pump and thermometer setup or a lagering box. For more about maintaining temperature, read "Techniques" on page 65.

Lagering

The period following fermentation called lagering allows the beer to condition in cool temperatures, which produces a smoother beer and allows the proteins and haze to settle out. You can also "lager" ales to achieve the same results. Before lagering, many brewers recommend transferring the beer from the primary fermenter to a secondary just after fermentation is finished to separate the beer from the dead yeast cells, which can produce off odors if left in contact with the beer during the lengthy conditioning phase. A diacetyl rest is also recommended following primary fermentation to remove any diacetyl produced during fermentation, which can cause buttery flavors. This is done by raising the temperature of the beer to 55 to 60 °F (13 to 16 °C) for 24 to 48 hours before cooling back down for lagering.

Down Under Dark Ale

Tips from the pros

The Aussies' take on an English classic

by Betsy Parks

Are Australian beers all light-bodied lagers? Many Oz craft brewers respond to that question with a resounding "no!" Among the styles found in pubs and breweries around the continent is dark ale — a holdover from some of the earliest English brews. These two pros tell us what it takes to get it right.

CHUCK HAHN, Brewmaster at Malt Shovel Brewery in Sydney, Australia. Chuck learned to brew while working for ten years at Coors Brewing after earning degrees in Chemical Engineering from the Colorado School of Mines in Golden, Colorado. He came to Australia in 1981 and has been brewing there and in New Zealand ever since.

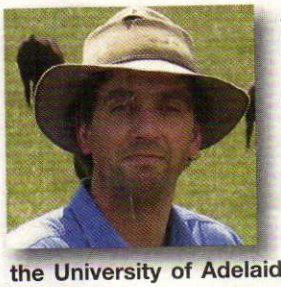
Currently, the majority of beers in Australia are lighter style lagers so the classic dark ale is beer with more of an English-style origin due to the earlier settlers being of English descent. Early Australian brewers all brewed ales until the introduction of refrigeration in 1888 after which most then switched quickly to lager styles as they were more refreshing.

At Malt Shovel Brewery we brew ales in honor of James Squire, Australia's first brewer. He arrived in Sydney as a convict on the First Fleet in 1788, became a free man in 1794 and established the first brewery. Our James Squire Original Amber Ale is a style similar to the ale that he would have brewed in the early 1800s. However, in the interest of greater acceptability, we have filtered and carbonated the ale. The most popular dark ales in Australia would include our Amber Ale, Cooper's Dark Ale and Toohey's Old Black Ale. Toohey's Old would be the largest volume and it has been around for almost 130 years. It is brewed with pale malt, about 10% black malt and about 30% sugar.

With the JS Amber Ale, we formulated for similar color and mouthfeel as a Newcastle Brown Ale, but with less after sweetness. We wanted sufficient citrus hop character to clean out the palate and enough roasted malt character to create slight toffee and nutty flavor notes. Hop bitterness is 20 IBUs and the gravity is about 2 °Plato.

Our ale is brewed with about 20% medium dark crystal malt and about 10% sugar to lighten the brew and balance the pale malt. Kettle hopping at the start of the boil is with Australian Super Pride hops and Australian Willamette hops are added at the end of boil to create subtle citrus aromas.

We mash in at 140 °F (60 °C) and use a rising infusion mash to convert the malt starch with one temperature hold around 145-149 °F (63-65 °C). The lauter tun is loaded at 167 °F (75 °C). We start fermentation with a robust ale yeast at 59 °F (15 °C) and allow it to warm up to 64 °F (18 °C) for diactyl reduction. Cool to 39 °F (4 °C) and remove the yeast then further cool to 32 °F (0 °C). Most homebrewers might have difficulty with such precise temperature controls.



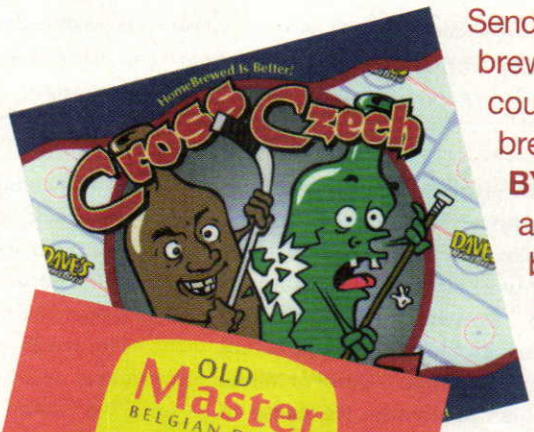
ASHLEY HUNTINGTON, owner, brewer and farmer at the Two Metre Tall Brewing Company in Tasmania, Australia. Ashley completed an honors degree in organic chemistry at the University of Melbourne. He later completed a Graduate Diploma in Oenology at the University of Adelaide and worked as the senior winemaker and director of Domaine de la Baume in the Languedoc region of France from 1998 until 2004 when he and his wife Jane returned to Australia to purchase a 1,483-acre (600 ha) property to develop an on-farm, sustainable brewery where they grow their own grain and hops.

We have a line of ales called our "Tasmanian River Ale series — good water, good beer!" which is designed to use ingredients grown in the region of the featured river. We have a dark ale in this series called the Huon Dark Ale. I wanted a dark ale — not a porter, not a stout. I draw the line between these three in terms of palate weight, with dark ale being the least heavy. Whilst very dark in color, I wanted the ale to retain its drinkability.

I use five malts in the Huon Dark Ale: pale base malt, Vienna, Munich (which is more melanoidin than classic Munich malt), crystal malt and a roast malt prepared from de-husked barley. The aim is to build a fully flavored, creamy base ale so I layer up the malts of different color and flavor profiles. Too much roast malt and the ale is extractive, too much base malt and the ale is skinny. For the hops I use Tasmanian-grown Hallertau, which have a lovely spicy character without being too bitter and extractive. I add the hops gradually throughout the boil (60 minutes), and up to 9% unpasteurized, unfiltered apple juice after the boil. I ferment at 15–20 °C (59–68 °C). Like most of our ales I second ferment to give positive pressure in the bottle rather than fizz. Our ales are naturally sparkling (not fizzy) and the darker and fuller the ale, the softer the carbonation should be. Ideally I would love to give this ale six months to bottle age prior to selling it.

If you want to brew a dark ale, always remember that they are ales, not lagers — don't over chill. Also, why not try serving them just below ambient temperature in a large volume red wine glass at a dinner party? It would be sure to get your guests talking!

Brew Your Own — 14th Annual Homebrew LABEL CONTEST



Send us your best homebrew labels and you could win some great brewing prizes from **BYO** advertisers! Enter as often as you like, but you can only win one prize. Winners will see their artwork featured in the July-August issue of the magazine. **Deadline to enter is May 1, 2009.**

Rules: Entrants can send labels or labels already stuck to bottles. The bottles can be full of beer. No digital or electronic files will be accepted. All other rules are made up by the editors of *BYO* as we go along. Labels are judged in one category, open to graphic artists and amateurs alike, so ultimate bragging rights are on the line. When submitting your labels, tell us a bit about the artwork and its inspiration. Is it hand-drawn? Created on a computer? Send us your best labels, tell us how you made them, and good luck!

Brew Your Own — Label Contest Entry Form

Name _____

Address _____

City _____ State/Prov _____ Postal Code _____

E-mail _____

Daytime Phone _____

All original artwork? Y or N (circle one)

Send your entry to:
BYO Label Contest
5515 Main Street
Manchester Center, VT 05255

DEADLINE: May 1, 2009

Local Yeast Lore

Dry hop dilemma, freezing temperatures

"Help Me, Mr. Wizard"

by Ashton Lewis

Hometown yeast?

I have a brewing friend who aspires to make a beer where all the ingredients come from his home state of Maryland. He's apparently caught up on the yeast. He wants a native strain from Maryland. Is there such a thing? Are there regional strains of yeast (I presume naturally occurring)?

Steve Brown
Grayslake, Illinois

My take on brewing yeasts comes from a combination of science, historical accounts and many sessions thinking about how modern brewing emerged. Plain and simple, brewing yeasts that we brewers use to transform wort into the wonderful elixir we call beer do not occur in nature. This may sound like an odd and incorrect statement. After all, if brewing yeast does not occur in nature, where did it come from originally?

Brewing yeast did originally come from nature. But the modern age of brewing is hundreds of years old and breweries have housed, guarded and cultivated yeast throughout this period. In a typical brewery fermentation there is a four-fold increase in yeast cells and each time a yeast cell divides there is a chance for mutation, just like with the reproduction of all life. Unlike animals with relatively long lives and infrequent breeding, yeast cells are veritable bunny-rabbits and the rapid divisions greatly reduce the time for significant mutations to occur. This is why the yeast used in breweries is so different from yeast found in nature.

There are beers made using wild yeasts (and bacteria), such as lambics in Belgium, but to my knowledge the state of Maryland has no real history using wild yeasts to produce beer. By the way, my brewing career began when I was a homebrewer in Maryland and this fact, of course, makes me an expert on Maryland brewing! If your friend is serious about wanting to brew beer with native yeast, I suggest taking a lesson from winemakers.

Some wines produced in the United States are still made by relying on yeast that live on the skins of grapes. Many other fruits are also covered in yeast and can be used as the source of native yeast. The white, powdery looking stuff on many fruits, such as grapes, blueberries and apples, is referred to as "bloom" and is wild yeast. Maryland does have apple orchards and wild yeasts could be cultured from the bloom on Maryland apples.

The downside to this adventure is that brewers use cultured brewing yeasts instead of wild yeasts for a variety of reasons, including consistency, attenuation, fermentation performance and, most importantly, finished beer flavor. The stuff you are able to culture from the environment is likely to produce less than stellar beer and many trials resulting in disappointment will probably occur before finding a suitable yeast strain. If your buddy has determination and is able to keep his chin up during his odyssey this could be a really fun project. On the other hand, if he has a fragile ego and doesn't do well with failure this could scare him away from brewing forever. If it were me, I'd try to get a hold of some of the yeast used to produce the Baltimore classics National Bohemian, affectionately called Natty Boh, and National Premium.

Dry hopping

I've constructed a dry hop capsule from 1" PVC and stainless steel screen. There's plenty of room in there for 1–2 ounces (28–57 g) of leaf or pellet hops. My plan was to suspend the filled capsule inside my fermentation vessel (15-gallon/57-L plastic conical). Since then I've read that dry hopping should be avoided in the primary due to the scrubbing action of the yeast. My issue is that I don't transfer to a secondary so dry hopping in my conical is out of the question. My second thought was to drop the hop filled capsule into my corny keg during the initial fill. Now I'm reading that the hops themselves could be loaded with infectious microbes, and that the only way to avoid a hop-born infection is to employ a hop-back, whereby the hops are sanitized by the hot wort. My question is this: if my hops (leaf or pellets) are kept in the freezer does the low temperature kill microbes that may be present?

Mark Meadows
Enterprise, Alabama

There are few practices in brewing that transform beer as much as dry-hopping and I think every homebrewer who loves the aroma of fresh hops should try dry hopping. The great thing about dry hopping is that all of the stories you cite about it are totally bogus. Specifically, you can add hops whenever you want to your beer and there is NO risk of spoiling your beer with microorganisms from hops.

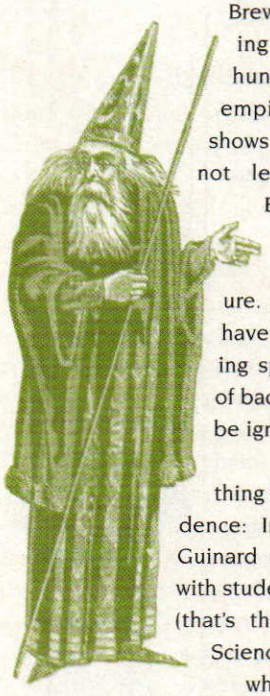
Most brewers do dry hop after fermentation is complete because the carbon dioxide produced during fermentation does strip hop volatiles and reduces the impact of the hops added. Dry hopping during fermentation can also plug up your airlock. That's a bad thing, so dry hopping after fermentation is complete is practical and that's why it is usually done at the end. As far as what vessel the hops are added to I beg to differ with those who make a big deal about it needing to be done in a secondary fermenter.

Many craft breweries who dry hop add hops through the top of the fermenter after primary fermentation is complete. Brewers using this practice usually use pellet hops and there is no reason to contain the pellets in any device since they settle to the bottom of the fermenter and the beer is easily racked off of the hops after aging. So if you want to add hops to your conical fermenter go ahead and throw them in!

Other brewers prefer using cone hops for dry hopping and it is fairly common to put the cone hops in some sort of container. Sierra Nevada, for example, uses what is akin to a giant teabag to dry hop some of their brews. The bag is sewn up after filling with hops and then hoisted into the tank through the bottom. Fermented beer is then brought into the fermenter where the hoppy goodness from this giant hop teabag infuses into the beer. The practical advantage of this method is that the hops are contained in the bag and much easier to remove from the beer versus whole hops simply floating around in the tank.

Some beers, notably cask ales, are dry hopped with whole hops that are not contained in any special device. You can do this at home if you wish, but whole hops can cause clogging problems, for example in the dip tube of a Cornelius keg. For this reason I recommend putting whole hops in some sort of container like your PVC and stainless steel mesh tube. At Springfield Brewing Company we use nylon mesh bags with nylon zippers to contain whole hops used for dry hopping. These bags are used to contain lacy things like women's underwear during laundering, but they also work for dry hopping.

I can cite scientific studies explaining why dry hopping does not spoil beer, but a more convincing and practical argument can be made in favor of dry hopping. Breweries have been producing dry-hopped beers for hundreds of years and empirical evidence clearly shows that dry hopping does not lead to beer spoilage. Brewers as a rule do not continue to use a practice that results in failure. So whatever stories you have heard about hops causing spoilage in beer because of bacteria on the hops should be ignored.



And now for something other than anecdotal evidence: In 1990, Dr. Jean-Xavier Guinard conducted a nice study with students enrolled in FST 102B (that's the Malting and Brewing Science lab class at UC-Davis) while working on his PhD. Fermenting wort samples were dry hopped and samples were taken over time to monitor the types of yeast and bacteria found. Hops do harbor bacteria and wild yeast, but these organisms don't grow in beer. The results of this study showed that wild yeast and bacteria populations found in the hops diminished after being added to the fermenter; two days following the addition of hops to the fermenting wort there were no extraneous organisms detected by the microbiological plating methods used. This study was published in the *Master Brewers Association of the Americas Technical Quarterly* in 1990 (MBAA TQ, 1990, 27(3), 83-89. The microbiology of dry hopping. Guinard, J.X., Woodmansee, R.D., Billovits, M.J., Hanson, L.G., Gutierrez, M.J., Snider, M.L., Miranda, M.G. and Lewis, M.J.)

One brief note on freezing as a method of killing microorganisms . . . it doesn't work. Bacteria and yeast survive freezing quite well, especially if ice crystal formation is limited. This is the reason that raw chicken that has been frozen has to be treated with proper precautions in the kitchen. Since hops are dried, putting them in the freezer simply makes them cold and there is no ice crystal formation that could marginally reduce the population of microbes (ice crystals kill, but don't render anything sterile).

Creating cloudiness

I heard somewhere that you can add flour to the brew kettle when making hefe weizen to help with cloudiness in the finished beer. If this is right, how much should I use for a five-gallon (19-L) batch?

Chris Norvell
via email

I have never heard of this practice being used to brew cloudy beers and can find nothing on the subject in the resources I have. I can, however, offer some advice from my personal experience brewing wheat beers. While I don't think winning medals in beer contests is a meaningful indicator of brewing prowess, medals do give brewers something to brag about. We have won numerous medals for our Mueller Unfiltered Wheat and Mueller Hefe Weizen brewed at Springfield Brewing Company and I have some thoughts on cloudiness.

Our brewery has been open for 11 years now and our best selling beer has always been our Unfiltered Wheat. This is an American-style wheat beer made using raw wheat, malted wheat, malted barley, German aroma hops and WLP001 California Ale yeast. When this beer was first brewed we used malted wheat from the United States. While the beer tasted nice, the cloudiness was very inconsistent and the beer clarified over the 7–10 days it sat in the serving tank.

The wheat malt we used at the time was made from white wheat and I wondered if using red wheat malt would have any effect on the cloudiness. Red wheat, commonly used by bread bakers, usually contains more protein than white wheat varieties so I selected wheat malt made from red wheat. Although the total protein was not much higher than barley malt it was higher than the protein in our white wheat malt, and more importantly the protein composition of wheat is different than barley and I was hoping for the best. The result was pretty exciting: excellent cloud that was stable during the time period required to dispense a batch of our wheat beer. We switched to Weyermann pale wheat malt and that is what we have used for the past 8–9 years.

The other factor in cloudy beer is yeast. When we first opened our doors I used a British ale yeast strain that was very flocculent. This caused a few problems for the type of beers I wanted to brew and I quickly switched strains. The WLP001 strain we currently use is not very flocculent and enough yeast remains in suspension to produce a nice yeast haze that isn't muddy looking. Some wheat beers I have sampled contain so much yeast that I find the appearance unappealing. I prefer a beer that is opalescent to one that resembles Mississippi River water after a very heavy rain — but that's just my opinion, and for me the combination of grains along with our yeast makes for a very attractive glass of beer.

Our beer does contain raw wheat (10% of the total grist weight) and flour is simply raw wheat that has been milled. So I suppose if you wanted to add some flour that you could use a similar proportion. Wheat starch has a low gelatinization temperature and is converted in a normal mash. This is different than other starchy

adjuncts such as rice and corn that must be boiled prior to conversion. I think the raw wheat adds whiteness to our beer and enhances the appearance.

Our hefe weizen, however, only contains malted wheat, malted barley and a little dark crystal malt for color. While it remains cloudy while on tap it lacks the opalescent appearance of our unfiltered wheat. So that's what I know about cloudiness. If all else fails, you can shake it. Some wheat beer kegs are stored upside down and turned before tapping. Some bartenders give kegs of unfiltered beer a periodic shake to keep the beer cloudy and bottles of hefe weizen are often rolled after pouring to ease the yeast from the bottom and this slurry is then poured into the glass before serving.

Frozen lager problem?

I brewed my first lager a month ago, an Oktoberfest. I don't have the money for a temperature control yet so I did my best to keep it in the mid to low 50s °F (10–13 °C). The temperature fluctuated between the high 40s and 60 °F (7 and 16 °C), mostly in the 52 to 58 °F (11 to 14 °C) range. Once fermentation completed I racked it into the secondary and slowly decreased the temperature. It was at 36 °F (2 °C) so I dialed the fridge down a bit more to try to get it down a few more degrees. When I checked on it the next morning the water in the airlock was frozen solid and there were ice chunks floating in my beer. I immediately dialed the temperature up — the fridge is now at 38 °F (3 °C), the airlock is unfrozen, and the icebergs in my beer are shrinking. What affects will the partial freezing have on my beer? I know Eisbocks are partially frozen to boost their alcohol content, but does freezing have any other effects? Was turning the temperature back up slightly the best course of action or should have I warmed it quicker? Will the fluctuating fermentation temperature have an adverse affect? I'm concerned that I've ruined the batch.

Ross Druckenmiller
Brighton, Massachusetts

There is no need to worry, partially freezing your Oktoberfest did not ruin the batch. And I don't think a rapid thaw versus a slow thaw is anything to lose any sleep over. Remember ice beers? Unlike freeze-concentrated beers like eisbock, domestic ice beers were treated to mellow the flavor, not increase alcohol content. Freeze concentration is not permitted by US alcoholic beverage laws because of some bizarre logic cooked up by a group of lawmakers. You can legally brew a barleywine that is 12% alcohol, for example, but you cannot legally make an Eisbock that is 8% alcohol. Go figure!

In any case, domestic ice beers are made by initiating ice crystal formation and then the ice is allowed to melt. Although this sounds like some goofy process used for one reason and one reason only, marketing, there is actually something of substance going on. Reactions between proteins and polyphenols are accelerated in the process and the result is a smoother tasting beer — that is if you're really concentrating hard

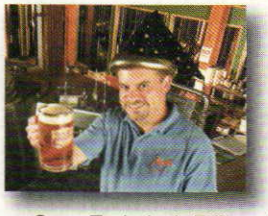
on the beer since the non-ice version of most ice beers are pretty darn smooth before being iced. Ice beers had a brief flurry as the "in" thing before dropping down to a minor segment in the domestic lager category.

The good news is that if millions of barrels of ice beer have been made and sold by partial freezing followed by thawing, you can rest easy knowing that your beer has not been messed up by your technical difficulties with your thermostat. Plus you can also label your beer Druckenmiller's Oktoberfest Eis and come up with some fancy artwork depicting an iceberg floating in your carboy.

I had this happen to me once with a 500-gallon (1,893 L) batch of lager. During aging the specific gravity began to increase. At first I was wondering if Craig, who now works in an innovation group at Anheuser-Busch, was having technical difficulties with the hydrometer. But brewers who can't properly operate a hydrometer typically don't go on to work at AB and the specific gravity in the tank was indeed rising. So like all practical brewers we immediately grabbed our tasting glasses to assess the anomaly with our most important analytical tools and our palates quickly identified what was going on . . . our helles lager was turning into helles bock.

"Unlike freeze-concentrated beers like eisbock, domestic ice beers were treated to mellow the flavor, not increase alcohol content."

No big deal, we just let the beer warm up prior to filtration. This was a pretty neat mistake because as the beer was pumped from the tank and into the filter, the density changed. When we opened the tank after filtration, a small, funky chunk of ice confirmed our suspicions.



Brew Your Own Technical Editor Ashton Lewis has been answering homebrewing questions as his alter ego Mr. Wizard since 1995. A selection of his Wizard columns have been collected in "The Homebrewer's Answer Book," available online at brewyourownstore.com.
Do you have a homebrewing question for Mr. Wizard? Send it to wiz@byo.com or mail to *Brew Your Own*, 5515 Main Street, Manchester Center, VT 05255. If your question is selected for publication you will recieve a free BYO beer stein! Unfortunately, Mr. Wizard can't respond personally. Sorry!

Irish Red

Try it as an ale — or a lager

by Jamil Zainasheff

Fritz Maytag, of Anchor Brewing fame, during a speech many years ago, explained how the "story" around something is a big part of the experience. An interesting tale can even make something taste better. It was an idea new to me at the time, but I'm a firm believer ever since. Essentially, if you're excited about how something was made, you'll enjoy it more. I think the same thing goes for environment: a given beer tastes better the more you enjoy the environment. Drinking with good friends? Favorite music playing? The beer tastes better. I've also come to realize that beer names can have the same effect. This is why most breweries give their beers creative names, to evoke a positive response in the consumer.

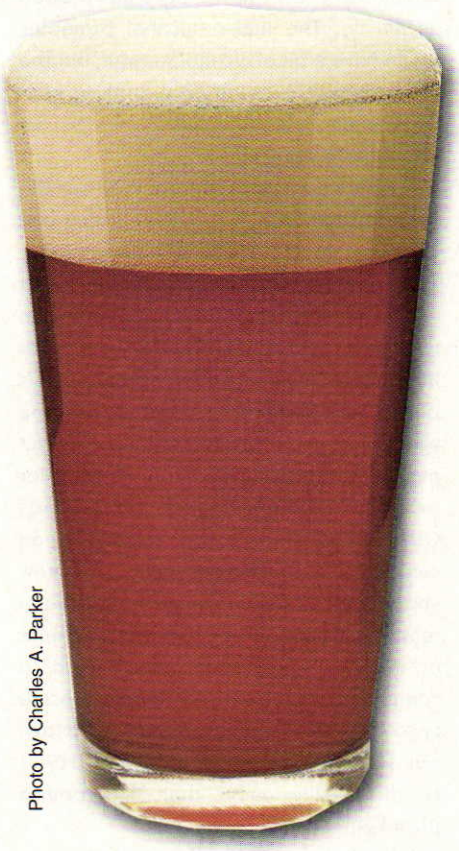


Photo by Charles A. Parker

IRISH RED ALE by the numbers

OG:	1.044–1.060
FG:	1.010–1.014
SRM:	9-18
IBU:	17-28
ABV:	4.0–6.0%

Nearly a decade after I heard Fritz speak I was in Australia to attend the first Australian National Homebrewing Conference. A good friend took me to the Holgate Brewhouse in Woodend where I ran across a beer name that interested me, Big Reg Lager. "Ah," I thought to myself, "This must be named after some local hero? A dear friend of the brewer maybe? Probably a mountain of a man with a wild mass of flaming red hair. A big, friendly guy, named Reginald, but everyone called him 'Reg.'" I could almost see his kind face, his smile exposing one gold tooth, atop his massive shoulders. It was a wonderful beer and I enjoyed it immensely. The funny thing is, I came to find out that they hadn't named it Big Reg. It was originally named Big Red Lager. The beer had won the 2008 Premier's Trophy for Best Victorian Beer in the Australian International Beer Awards. Somewhere along the line there was a mix up and their trophy was accidentally engraved "Big Reg Lager." Instead of worrying about it, they just changed the name of the beer. My imagined story of the heroic, barrel-chested Reg was lost, crushed on the cruel, rocky shores of a typo. Still a great beer, but with a different story. I wonder if I would have enjoyed it as much had I tried a "Big Red Lager." If you ask me, "Red" doesn't convey as much excitement as "Reg" and that got me thinking about how many different red beers and red beer styles are out there, such as Irish red ale.

Irish red ale is a balanced, easy-drinking pint, with a moderate malt character full of caramel and toasted notes. The deep reddish copper color comes from both crystal malt and a small dose of highly kilned grain, such as roasted barley. Despite a slightly sweet overall character, the highly kilned grain adds a touch of dryness to the finish and can add a very slight touch of roasted flavor too. Hop bit-

RECIPE

Irish Red Ale

(5 gallons/19 L, all-grain)

OG = 1.053 (13.2 °P)
FG = 1.014 (3.5 °P)
IBU = 25 SRM = 18 ABV = 5.2%

Ingredients

9.9 lbs. (4.5 kg) Crisp British pale ale malt or similar British pale ale malt
6.0 oz. (170 g) Great Western crystal malt (40 °L)
6.0 oz. (170 g) Great Western crystal malt (120 °L)
5.0 oz. (142 g) roasted barley (300 °L)
5.25 AAU Kent Golding pellet hops, (1.05 oz./30 g at 5% alpha acid) (60 min.)
White Labs WLP004 (Irish Ale), Wyeast 1084 (Irish Ale) or Fermentis Safale US-05 yeast

Step by Step

Mill the grains and dough-in targeting a mash of around 1.5 quarts of water to 1 pound of grain (a liquor-to-grist ratio of about 3:1 by weight) and a temperature of 153 °F (67 °C). Hold the mash at 153 °F (67 °C) until enzymatic conversion is complete. Raise the temperature to mash out at 168 °F (76 °C). Sparge slowly with 170 °F (77 °C) water, collecting wort until the pre-boil kettle volume is around 6.5 gallons (24.6 L) and the gravity is 1.041 (10.3 °P).

The total wort boil time is 90 minutes. Add the bittering hops with 60 minutes remaining in the boil. Add Irish moss or other kettle finings with 15 minutes left in the boil. Chill the wort rapidly to 66 °F (19 °C), let the break material settle, rack to the fermenter and aerate thoroughly. Pitch the yeast. Use 10 grams of properly rehydrated dry yeast, 2 liquid yeast packages, or make an appropriate yeast starter. Ferment the wort at 66 °F (19 °C). When the fermentation is finished, carbonate the beer from 2 to 2.5 volumes.

RECIPE (continued)

Extract with Grains Option:
Replace the British pale ale malt with 6.6 lb (3 kg) English pale ale liquid malt extract. I have used a couple of English-type liquid malt extracts with great results. Some shops sell extracts from 100% Maris Otter malt, which might be labeled English or British extract. John Bull Maris Otter, Edme Maris Otter, or Muntons are good products also. Always choose the freshest extract that fits the beer style. If you can't get fresh liquid malt extract, it is better to use 5.3 lb. (2.4 kg) dried malt extract instead. The crystal malt I use is from Great Western Malting Co. The roasted barley comes from Briess Malt & Ingredients Co. Feel free to substitute any high quality malt of a similar flavor and color from a different supplier.

Mill or coarsely crack the specialty malt and place loosely in a grain bag. Avoid packing the grains too tightly in the bag, using more bags if needed. Steep the bag in about 1 gallon (~4 liters) of water at roughly 170 °F (77 °C) for about 30 minutes. Lift the grain bag out of the steeping liquid and rinse with warm water. Allow the bags to drip into the kettle for a few minutes while you add the malt extract. Do not squeeze the bags. Add enough water to the steeping liquor and malt extract to make a pre-boil volume of 6.5 gallons (24.6 L) and a gravity of 1.041 (10.3 °P). Stir thoroughly to help dissolve the extract and bring to a boil.

The total wort boil time is 90 minutes. Add the bittering hops with 60 minutes remaining in the boil. Add Irish moss or other kettle finings with 15 minutes left in the boil. For the remainder of this recipe, follow the fermentation and packaging instructions for the all-grain version.

Eric the Red

(5 gallons/19 L, all-grain)

OG = 1.052 FG = 1.011
IBU = 29 SRM = 23 ABV = 5.2%

A bold version of an Old World beer style, influenced by "wild" hops from the new found land.

Ingredients

10 lbs. (4.5 kg) British pale ale malt (3 °L)
3.0 oz. (85 g) crystal malt (90 °L)
7.0 oz. (198 g) roasted barley (300 °L)
8 AAU Columbus hops (60 mins.) (0.66 oz./19 g of 12% alpha acids)
Wyeast 1056 (American Ale), White Labs WLP001 (California Ale) or Fermentis US-05 dried yeast (1 qt./1 L starter for liquid yeasts)
1 cup corn sugar (for priming)

Step by Step

Mash at 152 °F (67 °C) in 15 qts. (14 L) of water. Boil for 90 minutes, adding hops with 1 hour left in boil. Chill the wort rapidly to 66 °F (19 °C), let the break material settle, rack to the fermenter and aerate thoroughly. Pitch the yeast. Ferment at 66 °F (19 °C).

Eric the Red

(5 gallons/19 L, extract w/ grains)

OG = 1.052 FG = 1.011
IBU = 29 SRM = 23 ABV = 5.3%

Ingredients

1 lb. 6 oz. (0.62 kg) British pale ale malt (3 °L)
3.0 oz. (85 g) crystal malt (90 °L)
7.0 oz. (198 g) roasted barley (300 °L)
2.0 lbs. (0.91 kg) Muntons Light dried malt extract
3.75 lbs. (1.7 kg) Muntons Light liquid malt extract
8 AAU Columbus hops (60 mins) (0.66 oz./19 g of 12% alpha acids)
Wyeast 1056 (American Ale), White Labs WLP001 (California Ale) or Fermentis US-05 dried yeast (1 qt./1 L starter for liquid yeasts)
1 cup corn sugar (for priming)

Step by Step

Steep crushed grains in 3 qts. (2.8 L) of water at 152 °F (67 °C) for 45 minutes. Combine "grain tea," dried malt extract and water to make 3 gallons (11 L) of wort. Boil 60 minutes, adding hops at beginning of boil and liquid malt extract for the final 15 minutes. Cool, transfer to fermenter and top up to 5 gallons (19 L). Pitch yeast. Ferment at 66 °F (19 °C).

terness is evenly balanced, but the dark malt addition can make the beer seem a little more bitter than the IBU level would indicate. Hop flavor and aroma is often close to non-existent, but there are examples with a touch of hop character. This beer can be brewed as either an ale or lager, but either way the fermentation character should be relatively clean. The BJCP style guide mentions a light buttery character being acceptable, but this beer really shouldn't have distinct buttery notes. Perhaps a better way to describe it is toffee-like. Toffee is often made with butter. If your Irish red turns out to have toffee notes, that would be an OK amount of butter. If your beer has a butter character, then that would be too much. Brewed as a lager, an Irish red should have a lager profile. Brewed as an ale, the beer will have some esters, but the ester profile should be very restrained and subtle, just enough so you know the beer was brewed as an ale. The higher alcohol examples might have a bit of alcohol warmth, but the focus should be on an easy drinking pint. High levels of alcohol and alcohol flavors are not appropriate.

I prefer British pale ale malt as the base for Irish red. It provides a nice biscuit-like malt character background. British pale ale malt is kilned a bit darker (2.5 to 3.5 °L) than the average American two-row or pale malt (1.5 to 2.5 °L) and this higher level of kilning brings out the malt's biscuit and toasty flavors. If you're brewing with extract, your best choice is an extract made from British pale ale malt. Look for products labeled English pale, Maris Otter, or British-style malt extract. If you can't get it through your local homebrew shop, you can find it online from several retailers. If you use domestic two-row malt or extract made from it, you'll need to compensate with some additional specialty malts such as Munich, Biscuit or Victory, but show restraint. For a 5-gallon (19-L) batch, add no more than 0.75 pound (0.34 kg) total.

For the caramel or toffee character in this beer, the obvious choice is caramel/crystal specialty malts. What isn't obvious is where the reddish-copper color comes from. While one might be tempted to go heavy on the caramel-type malts to get both caramel flavor and a reddish color, doing so would most likely result in

too much caramel flavor and not enough color. The deep reddish copper color comes from a small dose of highly kilned grain that also adds to the dry finish of the beer. Dark roasted grain can quickly overwhelm this beer's flavor profile, so caution and precise measuring are important. In this beer style, you're looking for a balance of all flavor elements and being too bold in any one area will miss the mark.

Irish red ale generally has a medium-light to medium body. A single infusion mash around 153 °F (67 °C) strikes the proper balance between fermentable and non-fermentable sugars. For extract brewers, most light colored extracts will get you fairly close. If not, you can build a little more body without flavor impact by adding some dextrin-type malts to your steeping grains.

Target a bitterness-to-starting gravity ratio (IBU divided by OG) between 0.4 and 0.6. You're trying to achieve a slightly sweet start to the beer, with a balanced overall character, and a slightly dry finish. Normally, a single addition at 60 minutes is all you need. If you want a beer with some hop character, a moderate later addition, say 0.5 ounce (14 g), around 20 minutes is acceptable. Hop choice for bittering and flavor is fairly flexible. Kent Goldings, Fuggle, Challenger, Target, Perle and Magnum all work well. Don't use citrusy or catty American-type hops.

"Dark roasted grain can quickly overwhelm this beer's flavor profile, so caution and precise measuring are important."

This style can be fermented as either an ale or lager, though my preference is to brew it as an ale. Regardless, temperature control during fermentation is also very important. You want the beer to attenuate enough so that it doesn't have a sweet finish and you want to ferment it cold enough that any esters are restrained and the beer has a fairly clean character. While some commercial examples have a touch of diacetyl, keep any buttery flavors and aromas to an absolute minimum for the best results in competition.

Two great yeasts for brewing this style are White Labs WLP004 Irish Ale and Wyeast 1084 Irish Ale. You can't go wrong with either product. Irish ale yeast provides the right low-ester profile but is only moderately attenuative. You'll need to pitch the proper amount of clean, healthy yeast and keep a close eye on fermentation temperatures to ensure good attenuation. If you choose to go the lager route, you can use any continental lager strain with acceptable results.

Jamil Zainasheff writes "Style Profile" for every issue of Brew Your Own.

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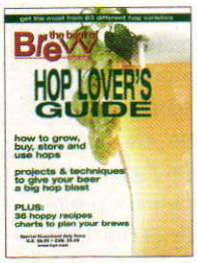

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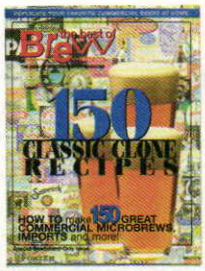

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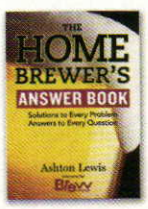

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TOP HONORS

THREE HOMEBREWERS GET A SHOT AT THE BIG TIME

Homebrew competitions — many brewers have entered their beers in contests of all sizes, in locales all around the world with the hopes of earning some feedback on their brewing techniques, for the thrill of a little friendly competition and, of course, the potential for homebrewing glory. Homebrewing events take place all year round, but only one competition sponsored by The Boston Beer Company, brewers of the Samuel Adams family of beers, entices homebrewers to compete for a chance to see their beers brewed on a commercial scale and sold on store shelves across America next to their other favorite craft brews.

First started in 1996 as the Samuel Adams American Homebrew Contest, LongShot is a competition organized as a nod to Boston Beer Company (BBC) founder Jim Koch's homebrewing roots. He brewed the first batch of Samuel Adams Boston Lager in his kitchen in 1984, which went on to become one of the most prominent beers in the American craft brew renaissance of the 1980s and 90s. Today Samuel Adams is one of the largest craft brewers, brewing more than one million barrels of beer a year. LongShot was established as Koch's way of showing the beer-drinking world that homebrewers can make some world-class beers.

"Having been involved with both homebrewing and commercial brewing for almost thirty years it was very clear to me that the line between a talented homebrewer and a practicing commercial brewer was arbitrary and invisible," Koch said of LongShot's origins. "I started as a homebrewer. I imagined beers that I wanted to drink and made them — and other people wanted to drink them, too," Koch said. And that hasn't changed. "That's frankly how it (BBC) succeeded," he said.

The Rules

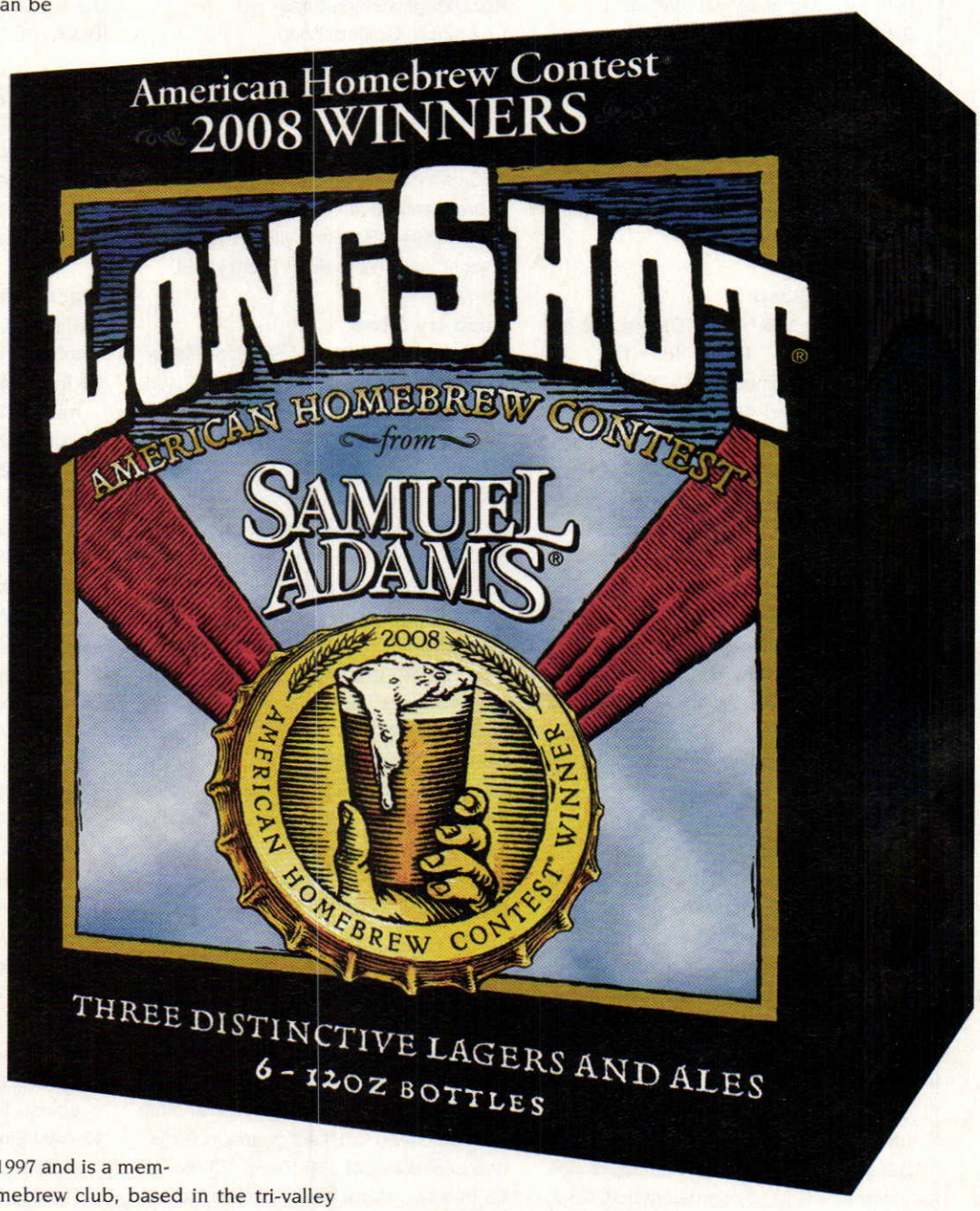
The beers in the 2008 variety package include winners from both the 2007 and 2008 LongShot American Homebrew contests as well

as the winner of BBC's annual employee homebrew competition.

LongShot is judged in stages in an attempt to fairly evaluate each entry based on the Beer Judge Certification Program (BJCP) guidelines. BBC recruits the help of BJCP and regional expert judges, which in 2008 included William Brand of *The Oakland Tribune*, Tony Forder of *Ale Street News* and Marty Nachel, author of *Homebrewing for Dummies*, for qualifiers held in Boston, Chicago and San Francisco. Koch and the panel of expert judges then taste the winning beers from those semi-finals and choose what they believe are the four best beers — including the contest winner, which can be a challenge.

"It's always very hard," Koch said of judging. "The final round of beers is always very good."

The brewers of those four beers are invited to attend the Great American Beer Festival (GABF) in Denver, Colorado to find out who will be the winner. During the festival, Samuel Adams also invites the semi-finalists of their own employee homebrewing competition, and GABF tasters vote on those beers to decide the winner of that contest. The winner of the consumer competition and the winner from the employee contest then collaborate with Sam Adams brewers to brew their recipes on a commercial scale.



Photos courtesy from Boston Brewing Company

The Brewers

So what does it take to win the LongShot? The stories of the winners included in this year's variety pack show that there are different paths to homebrewing greatness, but all paths point to a commitment for brewing great beer.

In the 2008 competition, California-based brewer Alex Drobshoff bested the more than 1,300 entries with his recipe for Traditional Bock. He started all-grain brewing in 1997 and is a member of the Mad Zymurgists homebrew club, based in the tri-valley area of California as well as being active in the Draught Board, one of the oldest homebrewing clubs in the US, and Club DOZE (the Diablo

Continued on page 27

RECIPES

Alex Drobshoff's Traditional Bock

(5 gallons / 19 L, all-grain)

OG=1.068 FG=1.014
IBU=28 SRM=16 ABV=6.6%

Ingredients

6.5 lbs. (2.9 kg) 2-row malt
6.5 lbs. (2.9 kg) Munich malt
0.75 lbs. (340 g) crystal malt 90 °L
0.1 lbs. (45 g) chocolate malt
6.75 AAU Hallertauer hops (1.5 oz./43 g at 4.5% alpha acids) (60 min.)
Wyeast 2206 (Bavarian Lager) or White Labs WLP820 (Oktoberfest /Märzen Lager) yeast in a 2-Liter starter.

Step by Step

Dough in at 118 °F (48 °C) and rest for 10 minutes. Rise to 131 °F (55 °C) for 20 minutes, 149 °F (65 °C) for 30 minutes and 158 °F (70 °C) for 20 minutes. This could be done with a single infusion mash at 149 °F (65 °C) just as well. Sparage for 45 minutes collecting 6.5 gallons (25 L). Boil for 90 minutes adding the hops after the first 30 minutes. Expect 5 gallons (19 L) at the end of boil. Cool to 55 °F (13 °C), transfer to your fermenter, aerate and pitch yeast starter. Ferment 10–14 days at 55 °F (13 °C) then let the temperature increase to 60 °F (16 °C) for three days. Rack it off of the yeast into a keg to finish lagering for 4-6 weeks.

Extract option:

Reduce the pale malt and Munich malt to 9 oz. (255 g) each. Add 4.5 lbs. light liquid malt extract and 4.5 lbs. Weyermann's Munich liquid malt extract. Steep crushed grains in 3 qts. (2.8 L) of water at 150 °F (66 °C) for 45 minutes. Combine "grain tea," Munich liquid malt extract and water to make 3.0 gallons (11 L) of wort. Boil 60 minutes, adding hops at times indicated in the all-grain recipe and pale liquid malt extract for final 15 minutes of boil. Cool, transfer to fermenter and top up to 5 gallons (19 L). Pitch yeast. Ferment, at 70 °F (21 °C).

Carissa Sweigart's Cranberry Wit

(5 gallons/19 L, all-grain)

OG= 1.046 FG= 1.011
IBU= 22 ABV= 4.4

Ingredients

4.5 lbs. (2 kg) of flaked wheat
5 lbs. (2.3 kg) of Belgian Pilsner malt
1 oz. (28 g) Sterling hops
1 oz. (28 g) Golding hops
0.25 oz. (7.1 g) bitter orange
0.5 Tb. cinnamon
1 tsp. coriander
0.35 oz. (1 g) grains of paradise
0.66 gallons (2.5 L) Ocean Spray cranberry juice
Wyeast 3944 (Belgian Witbier) yeast
Wyeast 3463 (Forbidden Fruit) yeast

Step by Step

Mash flaked wheat and Belgian Pilsner malt in 2.5 gallons (9.5 L) of 150 °F (66 °C) water for 60 minutes. Sparge four times with a 60 oz. pitcher, (approximately 7L total) with 170 °F (77 °C) water. Bring wort to boil for 20 minutes then add sterling and golding hops. Two minutes later add a tea bag of biter orange, cinnamon, coriander, grains of paradise. Cool wort to around 70 °F (21 °C) and pitch yeast. Transfer into primary fermenter and let sit for 14 days. Siphon beer directly into sanitized keg and add 2.5 liters (0.66 gal.) of Ocean Spray cranberry juice (add juice and taste). Also add 2 tablespoons each of potassium sorbate and potassium metabisulfite (for stabilization). Bottle and age for three to four weeks in cool corner.

Extract option:

Substitute flaked wheat and Belgian Pilsner malt with 1 lb. (0.45 kg) pale malt, 1 lb. (0.45 kg) wheat malt, 1 lb. (0.45 kg) wheat dried malt extract and 4 lb. 2 oz. (1.9 kg) wheat liquid malt extract. Steep crushed grains in 3 qts. (2.8 L) of water at 150 °F (66 °C) for 45 minutes. Combine "grain tea," dried malt extract and water to make 3.0 gallons (11 L) of wort. Boil 60 minutes. Add hops and spices at times indicated in the all-grain recipe. Add liquid malt extract for final 15 minutes of boil. Cool to 70 °F (21 °C), transfer to fermenter and top up to 5 gallons (19 L). Pitch yeast. Ferment at 70 °F (21 °C).

Mike McDole's Double IPA

(5 gallons/19 L, all-grain)

OG = 1.095 FG = 1.020
IBU = ~100 SRM = 7.4 ABV = 10%

Based on the Russian River Brewing Company's Pliny The Elder, this recipe has two hop additions (Northern Brewer and Cascade), a higher starting gravity and a 153 °F (67 °C) versus 151 °F (66 °C) mash temperature.

Ingredients

16.0 lbs. (7.3 kg) American two-row malt (2 °L)
1.0 lbs. (0.45 kg) Briess Cara-Pils® malt (2 °L)
0.5 lbs. (0.23 kg) corn sugar
0.5 lbs. (0.23 kg) crystal malt (40 °L)
0.5 lbs. (0.23 kg) wheat malt (2 °L)
9.75 AAU Chinook pellet hops (0.75 oz/21 g at 13% alpha acids) (Mash Hop)
23.4 AAU Warrior pellet hops (1.50 oz/43 g at 15.6% alpha acids) (90 min.)
13 AAU Chinook pellet hops (1.00 oz/28 g at 13% alpha acids) (90 min.)
9 AAU Simcoe pellet hops (0.75 oz/21 g at 12% alpha acids) (45 min.)
11.25 AAU Columbus pellet hops (0.75 oz/21 g at 15% alpha acids) (30 min.)
6.75 AAU Northern Brewer pellet hops (0.75 oz/21 g at 9% alpha acids) (15 min.)
13.2 AAU Centennial pellet hops (1.25 oz/35 g at 10.5% alpha acids) (1 min.)
12 AAU Simcoe pellet hops (1.00 oz./28 g at 12% alpha acids) (1 min.)
8.63 AAU Cascade pellet hops (1.50 oz/43 g at 5.75% alpha acids) (0 min.)

Recipes continue on page 28

Continued from page 25

Order of Zymiracle Enthusiasts). He developed his bock recipe to quench a thirst for the traditional beers of Germany.

"I have a lot of respect for the beers of Germany if for no other reason than their history," said Drobshoff. "I've heard stories from people who traveled to Germany about how beer was closely tied to the culture and how wonderful the beer is. However, this was always followed by people saying that the exported beer is never quite the same as it is in Germany." And since a trip to Germany wasn't an option for him at the time, he decided to make the journey in his homebrewery.

Drobshoff's bock recipe took some time to develop. Because of his homebrewing setup's limitations he could only brew his bock, a lager, during the cooler months of the year. He perfected the brew over the course of two winters before he felt it was ready for competition, later deciding the beer was ready for the LongShot after winning a few blue ribbons in other competitions. He spoke with humbleness about his win.

"Homebrew competitions are more for the feedback from experienced judges to help improve your process and choice of ingredients and less about winning — although winning is nice," he said. "I was working as a BJCP judge at the LongShot competition in San Francisco when I got the call from the Sam Adams rep to let me know that I was a finalist. It was a very emotional time for me and it took a while to really grasp what was taking place. I had just won my first Best In Show and I was pretty overwhelmed."

He said the recipe was developed to stay true to the style, although he chose to use Canadian two-row malt rather than Pilsner malt.

"There are many ways to arrive at a similar beer but this recipe seems pretty robust," he said.

Carissa Sweigart, a national sales representative for Samuel Adams, had only been brewing for a few years after coming to work for the company when her Cranberry Wit won the 2008 employee competition. This was her first time entering a homebrewing competition. She said she developed her beer's recipe both because she loves the particular Belgian style of beer on which it is based, and to give a nod to her days growing up on Cape Cod in Massachusetts.

"I wanted something that reminded me of my hometown," said Sweigart. "So I wanted to do a witbier with cranberry."

She downloaded a recipe for cranberry wit from the Internet and tweaked it to get just the flavors she wanted. The one big obstacle? Getting the cranberries.

"I definitely made this beer using trial and error," she said. It was March and she couldn't find any fresh cranberries. The solution was using cranberry juice from the grocery store. "I brewed it once and crossed my fingers. Then I added the cranberry right before I bottled the beer. I added a little bit and tasted . . . then added a little bit more and tasted. I didn't want to do a flavoring because I thought it would get lost in that witbier."

She also chose to add cinnamon and some grains of paradise for a result that is,

Continued on page 29

RECIPES CONT...

30 AAU Columbus pellet hops (2.00 oz/57 g at 15% alpha acids) (dry)
13.12 AAU Centennial pellet hops (1.25 oz/35 g at 10.5% alpha acids) (dry)
15 AAU Simcoe pellet hops (1.25 oz/35 g at 12% alpha acids) (dry)
White Labs WLP001 (California Ale) or Wyeast 1056 (American Ale) yeast

Step by Step

Mash at 153 °F (67 °C) for 45 minutes or until conversion is complete with a 1.3 quarts (1.23 L) of water per pound (0.45 kg) of grain. Raise the mash temperature to 165 °F (74 °C) and hold for 15 minutes. Sparge for 45 minutes with 170 °F (77 °C) collecting 6.5 gallons (24.6 L) of wort. Boil 90 minutes adding hop additions per schedule. Chill the wort to 68 °F (20 °C) and rack to the fermenter. Pitch an appropriate size starter and aerate. Ferment at 68 °F (20 °C) until 90% complete. Then add the dry hop and slowly raise temperature about one degree per day to 72 °F (22 °C). After 7 to 10 days, rack the beer to a keg or bottling bucket. Carbonate to about 2.5 volumes.

Extract option:

Replace the pale malt with 9 lbs. (4.1 kg) light dried malt extract. Steep the crushed grains in 3 qts. (2.8 L) of water at 153 °F (67 °C) for 45 minutes. Combine the "grain tea," dried malt extract and water to make 6.5 gallons (25 L) of wort. (You must do a full-wort boil to get the proper hop utilization). Boil 90 minutes, adding hops at times indicated in the all-grain recipe. Chill to 68 °F (20 °C) and transfer to the fermenter. Aerate well and pitch the yeast. Ferment at 68 °F (20 °C).

Think you have what it takes to win the Samuel Adams LongShot? Visit www.SamuelAdams.com for a list of contest rules, regulations and information about the 2009 Samuel Adams American Homebrew Contest. Entries must be received between April 15 and May 1 and the winners will be announced at the 2009 GABF in Denver, Colorado.

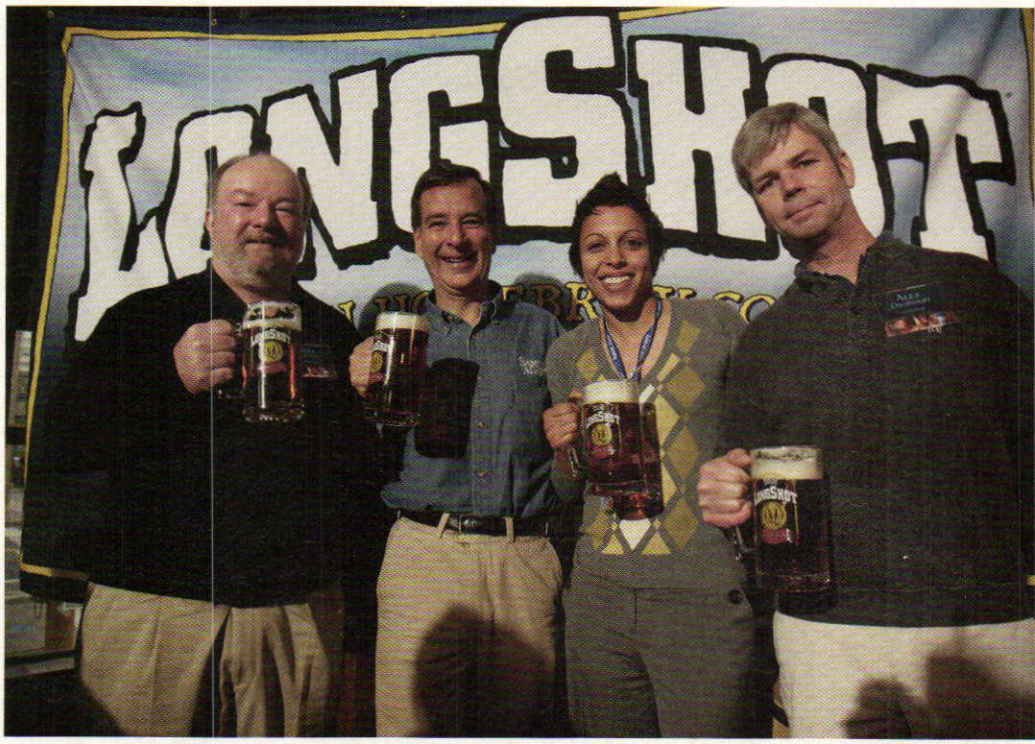
Continued from page 27

as she describes, a pink beer with lots of aroma.

"I opened the bottle and I was like, 'wow this might have a chance,'" she said.

Also in the variety pack is 2007 winner Mike McDole who took home the top honors for his Double IPA. Inspired by his love of hops and Russian River Brewing Company's Pliny the Elder, McDole's recipe called for seven types of hops, which translated into six pounds of hops per barrel — so many, in fact, it was held back for commercial brewing for a year due to the hops shortage of 2008.

"Vinnie (Cilurzo) gave out the recipe at the 2004 National Homebrew Conference," McDole said, which gave him a starting point. "I started to modify it and make it more to my liking, adding more favorite hops. As if five hops weren't enough, I went with seven," he said, laughing. It is stronger than most beers (9.5–10% ABV), which he said makes it pretty hard to dry out. His biggest obstacle was getting control over the fermentation by using healthy yeast, good oxygenation



(Left to right) 2007 LongShot winner Mike McDole, Samuel Adams Founder Jim Koch, 2008 Boston Brewing Company Employee Homebrewing Competition winner Carissa Sweigart and 2008 LongShot winner Alex Drobshoff toast to brewing excellence.

Samuel Adams founder Jim Koch announces the winners of the 2008 LongShot competition at the Great American Beer Festival held in Denver, Colorado last September. The four finalists for each year's competition are invited to attend the event as guests of BBC.

methods and focusing on water chemistry.

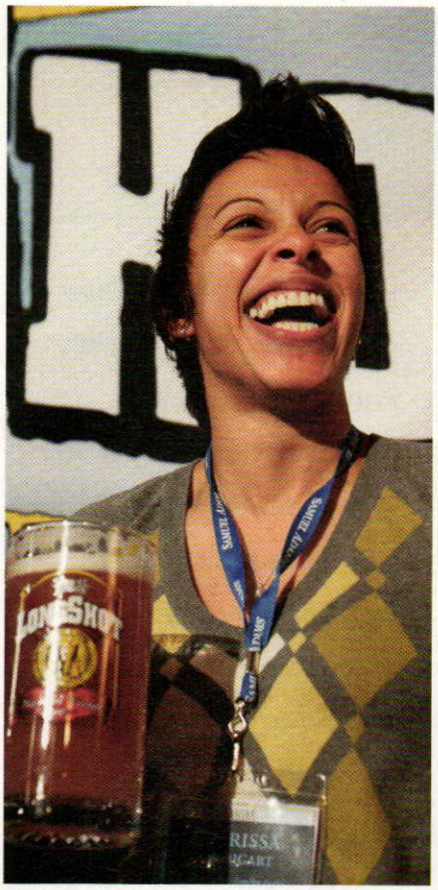
A 12-year homebrewer and member of the DOZE club (like Drobshoff), McDole started entering competitions in 2002. He said one strategy for winning is entering in a few different categories. But the most important method, of course, is brewing your best beer.

"I had three beers in the best of show round for the West and two of my beers made it into the final four. There's obviously a lot of luck placing in a homebrew competition, but to get there you have to make your own luck by making tasty homebrew," he said.

The Experience

Aside from the fame and accolades, the winning LongShot brewers said the competition was inspirational and rewarding.

"The homebrewing community is a very supportive group and I got congratulations from everyone," said Drobshoff. "The Sam Adams employees went out of their way to make us feel like part of a big family. Just the fact that they sponsor this



Carissa Sweigart celebrates her winning cranberry wit recipe at the 2008 GABF.

contest is a show of support that reaches across the lines between homebrewing and commercial brewing."

"It's one of the best wins of my life," said Sweigart. "Brewing beer is an amazing science and I've gotten a lot of great feedback from homebrewers at Sam Adams and at the GABF, so I'm very excited and I'm thinking about making my garage into more of a mini homebrew shop."

"It certainly has been an honor to win," said McDole, also praising the Samuel Adams brewers. "They have just been great and helpful, always keeping me in the loop. They really respect the idea and the process of homebrewing."

And back in Boston, Koch said the LongShot competition has been a fun experience for the company as well.

"I'm certainly proud of all the LongShot beers that have come out," said Koch. "Although they weren't my beers, we were proud to make them."

Betsy Parks is the Associate Editor of Brew Your Own *magazine and dreams of future homebrewing glory.*

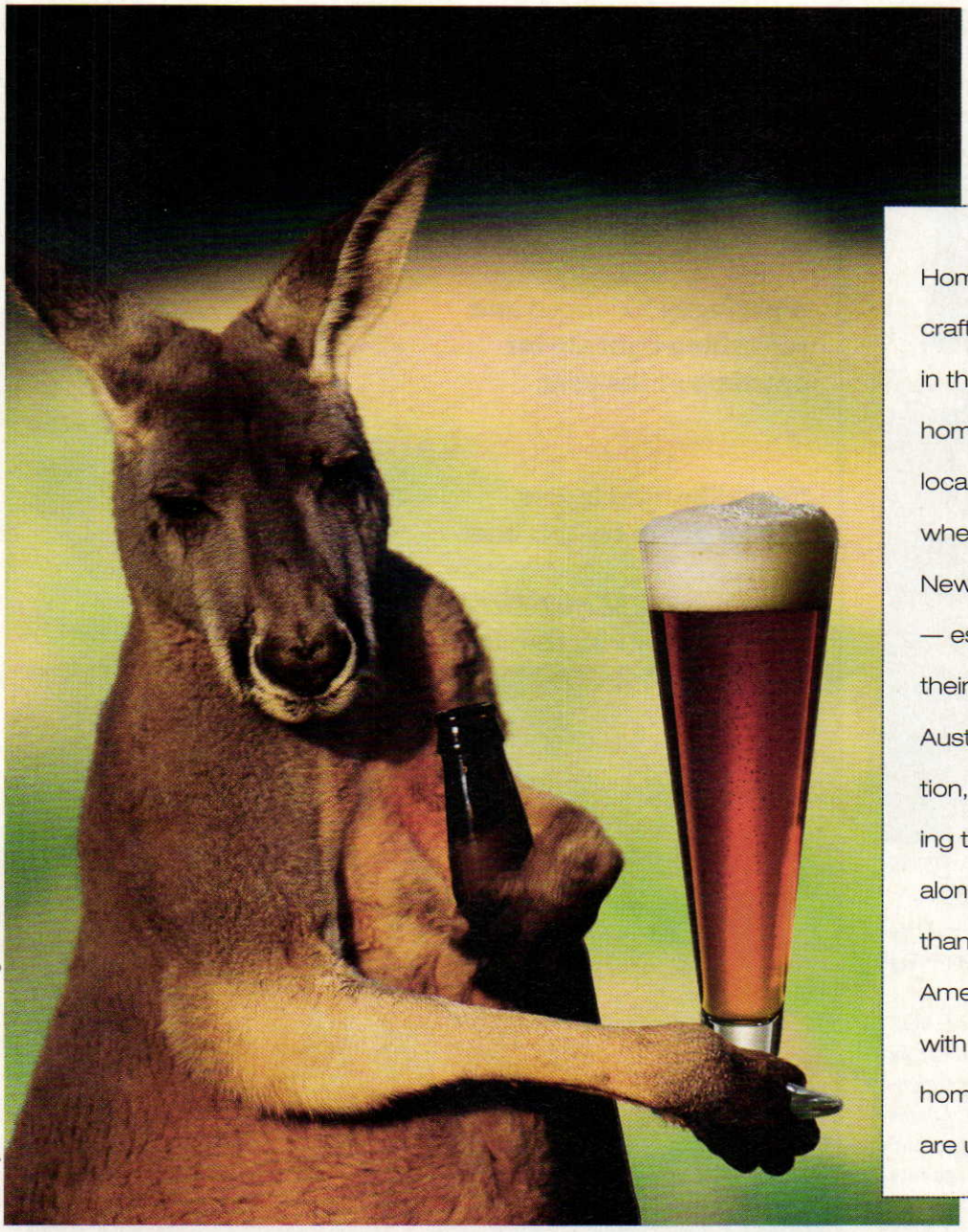


Photo by Charles A. Parker/Images Plus

Homebrewers practice their craft in almost every country in the world. In Australia, homebrewers brew with locally-malted barley and wheat and Australian and New Zealand-grown hops — especially when making their indigenous beer style, Australian Pale Ale. In addition, Australian homebrewing techniques have evolved along a slightly different path than those in North America. So come along with us and find out what homebrewers down under are up to.

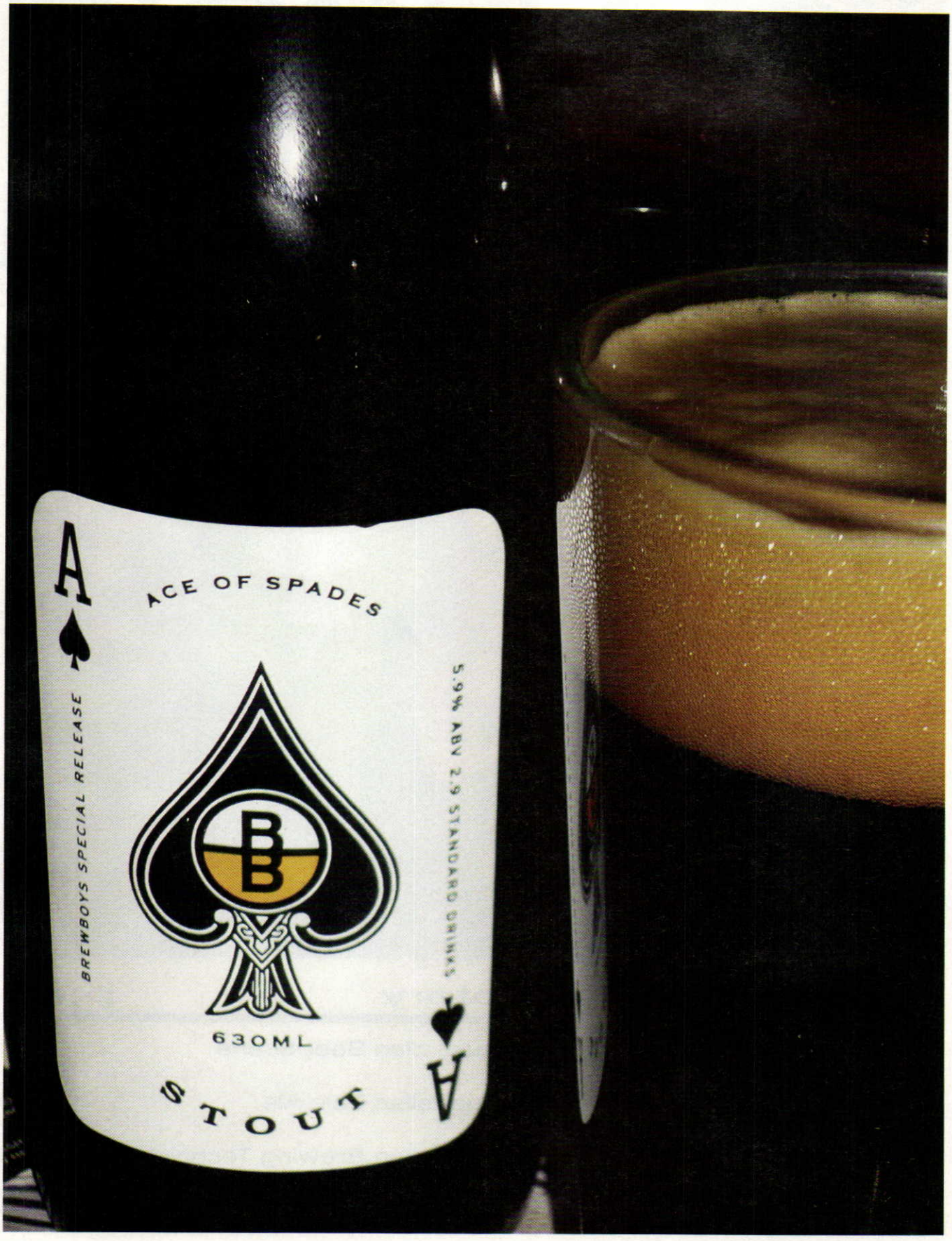
Photo courtesy of Tourism Australia

AUSSIE BREWING PACKAGE

Photo courtesy of Tourism Australia

story	page

by **LACHLAN STRONG**



australian BEER SCENE

THE HOMEBREWING SCENE in every country is strongly influenced by its overall beer scene and each is shaped by a different combination of laws, economics, agricultural products, cultural affinities and brewing history. So, to begin to understand Australian homebrewing, let me tell you a little about the Aussie beer scene — there's much more to it than just giant cans of Foster's.

Australian microbrewing is framed primarily by two brewing cultures — Great Britain's and the United States'.

INFLUENCES

Australian microbrewing is framed primarily by two brewing cultures — Great Britain's and the United States'. The inspiration and business model come from the microbreweries of the US, whereas the brewing history and tax system come primarily from the UK. Combine this with subtle differences in available ingredients and you have a beer scene that is familiar, yet subtly different.

Microbreweries in Australia have evolved in the same way they have around the world. The public is demonstrating an increasing openness to more flavorsome and interesting beers, and microbreweries are opening to service this market. The microbrewing industry in the USA is clearly leading the way, thus much

AUSTRALIAN NATIONAL HOMEBREWING CONFERENCE & COMPETITION

by Andrew Davison (ANHC Chairman)

On a warm September night in 2007, I sat with three other avid Aussie homebrewers around a dimly lit table in a local Melbourne pub to hatch a dream – to host the biggest event that Australian homebrewing has ever seen. A month later, the number had grown to 12, and the dream started to take form. After visiting the National Homebrewers Conference in the United States twice, John Preston considered the possibility of an Australian Conference. He approached the Australian State Home Brewing bodies, as well as *BYO* writers John Palmer and Jamil Zainasheff. 2008 saw the realization of that dream, and became a landmark year in Australian Homebrewing. The Inaugural Australian National Homebrewing Conference, ANHC '08, was held in Melbourne — 14 months, 2 weddings, 2 newborn children and 8 near divorces after first talking about it!

Nearly 250 delegates gathered from all around Australia and the world to share their brewing experiences and to hear what the array of experts assembled had to say about our favorite hobby.

The event was kicked off with the judging of the Australian Amateur Brewing Championship. 42 dedicated judges from all states to judge 192 entries from 99 brewers in a single morning session. (For the winning recipes see page 54). Nearly 60 keen homebrewers then boarded the ANHC bus and headed off to two of Melbourne's best micro-breweries, Mountain Goat and Two Brothers.

Jamil Zainasheff opened the conference with a talk that stressed that great beers more often result from making your brewing process simpler, rather than more complex, and he encouraged everyone to take a chance on simplicity.

Friday night saw two great events — the food and beer pairing dinner and Australia's first Club Night. The pairing dinner was organized by students at the William Angliss Institute, Australia's premier teaching college for the culinary arts and hospitality. Anna Solich, Danielle Williamson, Jennifer Saati and Brendon Ma served specialty beers and amazing meals to 150 delegates.

The four beers presented were brewed by local homebrewing legends John Strantzen, Charles Pedder, Tony Wheeler and Ron Feruglio (who now runs the Temple Brewing Company). These great beers were paired with a fantastic menu prepared by David Whitfield (Chef and teacher at William Angliss).

Starting at the same time, but running long into the night was Club Night, where nearly all delegates gathered together with members of 12 clubs from Melbourne, Sydney, Canberra, Adelaide, Brisbane and even as far afield as Perth. The boys from Canberra took home first prize for best club night brew, and Westcoast Brewers for best-themed stand.

During the conference, presenters from near and far informed the crowd. Jon Herskovits from Five Star Chemical talked about methods for cleaning and sanitizing. Brewers were heard to comment that this talk alone would change the way they brew forever. For others, the technical information John Palmer provided on water chemistry will make all the difference. On a historical note, local expert Tony Wheeler enlightened the audience with an account of the history and characteristics of Australian Pale Ale. (See his article on page 40). This style lives on today and is still brewed by Coopers Brewery as their Sparkling Ale, whose recipe has changed very little since 1864. Mark Hibberd gave a great session covering off-flavors, where delegates experienced the flavors first hand. This was followed up by Jess Caudill from Wyeast, who discussed the use of *Brettanomyces* in beers. On top of all of this, Mick Jonteff from Australia's Fosters Group, prepared two special conference brews to recipes that had been specified by the organizing committee. One was an Octoberfest ("Micktoberfest"), and the other a barley wine ("Claude 9" after one of the brewers).

The event was capped off by a Gala Dinner hosted by Paul Mercurio (star of "Strictly Ballroom" and presenter of the TV series "Mercurio's Menu"), where the awards from the Australian Amateur Brewing championship were handed out. For the first time, champion brewers from all states gathered in one place with the national winners in a showcase of the nation's best and brightest brewers.

"I can't believe how lucky I was to attend the first Australian National Homebrewing Conference," Jamil said. "Everything from the speakers to the food and of course the beer was flawless. I've been to many professional conferences. I've been to many beer conferences. This was the best of all worlds. I'm ready to visit Australia for the next conference!"

of the Australian industry's inspiration comes from it.

Australia inherited the British ale/bitter/stout tradition from the colonial era, which continues to some extent at a commercial level today. For linguistic and cultural reasons, the teaching of brewing at a commercial level is also strongly British-influenced.

The other significant influence on Australian brewing is the adoption of a British-style system of alcohol taxation. This involves higher tax rates as alcoholic strength increases. In a nation where the tax on alcohol is already high (about AUD $0.50 per bottle of standard-strength beer), this represents a significant disincentive towards the brewing of high-gravity beers. As a result, the vast majority of Australian beer falls somewhere in the 4.5–5.0% alcohol by volume (ABV) range, though bigger beers are becoming more prevalent.

The flipside of the tax system is that it's a great incentive for people to get into homebrewing! The difference in price between commercial and homebrewed beer is considerably greater in Australia than in the US.

Australia's microbreweries are currently lobbying parliament to receive a tax break similar to that which small winemakers currently receive. (For more information on this, go to: http://www.gopetition.com/petitions/excise-relief-for-australian-beer.html.

LOCALLY-GROWN INGREDIENTS

Australia grows a lot of wheat and barley, and there are several local maltsters which make quality products. These malts are widely used, though imported malts from the UK and continental Europe are now also readily available.

Hops are almost exclusively grown for alpha acid content, and the local variety Pride of Ringwood and its friends dominate. Pride doesn't enjoy the greatest reputation, which I believe is unjustified;

when fresh it gives an unsubtle but tasty brackish, herbal character which clearly demonstrates its English heritage.

Imported hops are widely available, but Australia's tough quarantine laws mean we are limited to pellets and plugs from everywhere but New Zealand. Not surprisingly, we use a lot of New Zealand hops! Varieties like Nelson Sauvin, Motueka and Riwaka are widely available and impart incredibly unique characters to beer — think "C" hops, but more tropical fruit than citrus, and you're close.

Australia hasn't been spared by the global hop shortage, but one positive has been the emergence of a new Australian hop variety, Galaxy. Galaxy has extremely high alpha acids (around 15%), but also lends a distinctive orange and passionfruit flavor and aroma. The few beers made with this hop that I've tasted have been very promising.

Another recent development has been the use of indigenous herbs and spices. This trend is being pioneered by the Baron's Native Range. They have produced beers flavored with roasted wattle (an Australian acacia species) seeds, lemon myrtle (leaves of a tropical plant) and passionberry (a bush tomato). To me, the jury is still out as to whether these additions represent jingoistic gimmickry or if they have any genuine potential as beer flavorings, but their uniqueness is inarguable.

As in the United States, the willingness of consumers to try more flavorful, fuller-bodied beers has led to a boom in small, craft breweries.

AUSTRALIAN BEERS

The wider beer market is dominated by two companies, Fosters and Lion Nathan, that mostly make plain lagers. In terms of influence on the microbrewing scene, two other breweries stand out: Coopers and Little Creatures.

Coopers is to Australia what Sierra Nevada is to the USA; the best beer you're

likely to find basically anywhere. As the last remaining brewery making Australian pale ales (APA), Coopers' beers play such a role in the Australian beer *zeitgeist* that many micros produce "Aussie ales" as their gateway beer. In my experience, these beers are often darker, more caramelly and less dry than Coopers, but their inspiration is clear.

Little Creatures began brewing after many other micros, but the success of their Pale Ale can take most of the credit for popularizing Australian pale ales with Australian micros. Australian pale ales are now almost ubiquitous, and consistently done well. Other excellent examples include Murray's Nirvana Pale Ale and Matilda Bay Alpha Pale Ale.

We're now seeing New Zealand hops being used in Australian pale ales to great effect. These beers have a distinct "New Zealand" character, while retaining the spirit of an Australian pale ale. Little Creatures Bright Ale is a good example, if a little light for an APA. Hargreaves Hill ESB is another example of new hop varieties taking the Australian pale ale style in a different direction.

Despite the popularity of Australian pale ales, truly hoppy beers remain rare. IPAs and double IPAs are brewed, but usually aim more for balance than outright hop power. Several brewers are of the opinion that they could never sell a hoppy beer, though more and more beers are disproving this theory. Regardless, great examples of IPA abound; Wig & Pen Brewers IPA and Beechworth Bling IPA are two favorites.

Australian pale ales are a favorite of the Australian craft brewers. Some of these beers feature hops grown in New Zealand. The imperial or double IPA trend still remains rare.

STOUTS

Each of the major Australian breweries still brew a stout, in many cases continuing a brand from the 19th Century. These beers have a small but dedicated following – even if their existence is just a concession by the marketing department to keep the brewers happy, as I was told by one brewer! In some ways, these stouts have been frozen in time since the beginning of the 20th Century. Whilst British stouts' gravities headed south as a result of wars and taxation, those in the former colonies (think Africa, Asia, the Caribbean) continued at their original strengths.

They are also very good beers! One of the very best — Southwark Old Stout at 7.4% — comes from Lion Nathan's South Australian plant. Coopers Best Extra Stout is the other classic example. These beers are strong and bitter with an intense tarry note, likely from the extensive use of Australian black malt.

Stouts and porters are also very popular at the microbrewing level. They are often slightly stronger than a brewery's other beers, and can range from 5% to 8% ABV. Perhaps because of the high standards set by the big brewers, stouts are often some of the best beers brewed by our micros. Wig & Pen Velvet Cream Stout is a rich, chocolatey classic and BrewBoys Ace of Spades is also a promising newcomer.

OTHER STYLES

Besides hefeweizens, German-style beers are seriously under-represented, though there are a few good examples. Czech

styles are even less prevalent. The lack of microbrewed lagers could be attributed to antipathy towards the dominant lager culture or the Anglo-American influence, but in most cases it's likely an even simpler explanation — cost.

There is one very interesting lager trend which has been slowly emerging – New Zealand Pilsners. Inspired no doubt by the transcendent Emerson's Pilsner, these beers showcase the tropical fruit flavor of New Zealand hops and often have a slightly sugary note from local Pilsner malts. A great Aussie example is Murray's Pilsner.

Belgian-style beers are occasionally attempted, but successes have been rare. The exception seems to be saison, which has been adopted particularly wholeheartedly by homebrewers with no temperature control! Saison could be our national style before too long – I can only hope. Several micros are also turning out interesting examples, my favorite to date being Feral Farmhouse Ale.

BREWPUBS

Whilst Perth and Melbourne might lay claim to being the best beer city in Australia, like in other parts of the world the best brewpubs are often in the more obscure locations.

The Wig & Pen is one of Australia's oldest and best brewpubs, serving up six regular beers and six seasonals (three via handpump) to students and bureaucrats — and travelling beer nuts — in Canberra. Their Imperial Stout is a truly profound example and they are the first Aussie brewery to utilize a "Randall."

Margaret River is better known for Cabernet, but is also a burgeoning beer region. It is home to Colonial, where they do a better Kölsch than you'll find in Cologne and a better brown ale than you'll find in Newcastle.

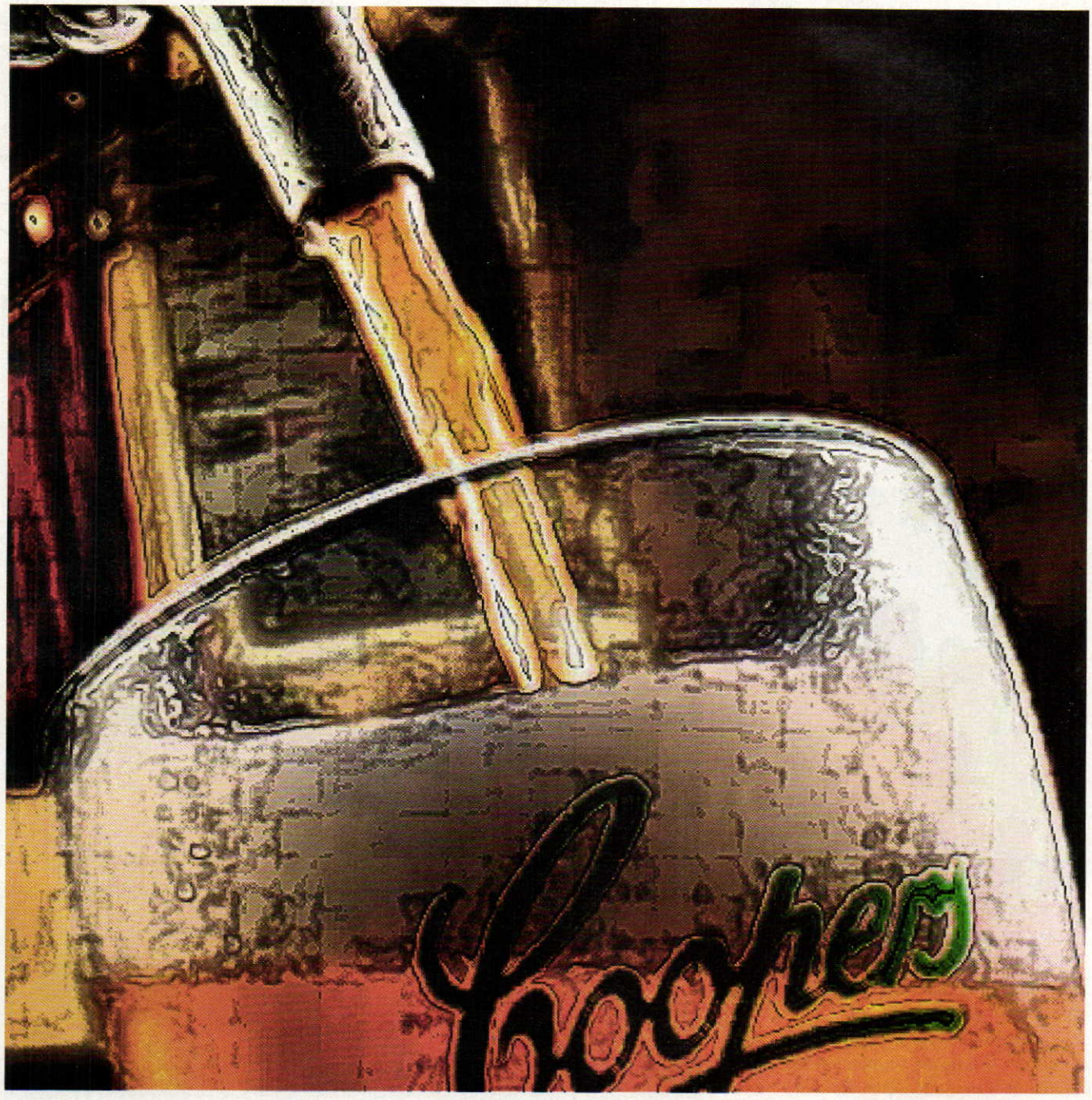
And then there's Murray's at the famous "Pub With No Beer" in Taylor's Arm. They don't have telephone reception, but they brew some fantastic beers, which are luckily distributed along the east coast. They have just launched a Brewer's Secret Stash range of 1,100-bottle releases, starting with a 10% imperial stout just in time for summer.

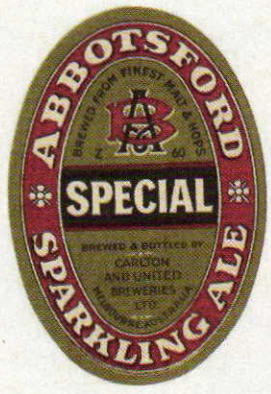
In a slightly more convenient location, Redoak produces an astonishing array of styles and pairs them with excellent food at their Sydney CBD restaurant. Their Special Reserve barleywine has been named Australia's Grand Champion beer, whilst their Baltic Porter is the top-rated Australian beer on Ratebeer.com.

Barely any of these beers ever make it out of Australia, so unfortunately you need to come here to try them. Australia isn't much of a player on the world brewing stage — Fosters notwithstanding! — but there is an interesting and diverse beer industry here which is improving by the day. Within this scene, the homebrewing community continues to grow, as evidenced in part by the recent staging of the first ever Australian National Homebrewing Conference (see page 36)

Lachlan Strong is an Australian homebrewer. This is his first full-length article for Brew Your Own.

by **TONY WHEELER**





australian PALE ALE

THIS ARTICLE TAKES A LOOK at Australian pale ale, as typified by Coopers Sparkling Ale — a beer with an unlikely name and an even more unlikely yeast sediment. Michael Jackson once described this beer as an Australian classic. If "classic" has anything to do with longevity, then after 146 years as the flagship beer of Coopers Brewery in Adelaide, South Australia — established 1862 and sole survivor of 350 independent Australian breweries in 1890 — I'd say this beer has earned the title! So let's see if we can replicate this classic from Downunder and judge for ourselves. Before we get into recipes though, let's try to come to grips with the style itself, so we can understand the Coopers example.

In Australia, pale ale (typified by Coopers Sparkling Ale) was ideally suited to the hot climate, and quickly became the predominant style.

ORIGINS OF AUSTRALIAN PALE ALE

For the first half-century of British colonization, the staple alcoholic drink in Australia was rum. So by the time brewing got seriously underway in the mid-19th Century, the world was already in the throes of a Burton-led Pale Ale revolution. Burton IPA was taking Britain by storm, and flooding into ports in every corner of the globe. In Australia, pale ale was ideally suited to the hot climate, and quickly became the predominant style. And as a

contemporary of Burton IPA, the Coopers example still bears the Burton imprint. It's a bottle conditioned pale ale that is very highly attenuated, owing to the use of "Burton style" yeast.

At 5.8% alcohol by volume (ABV), however, compared to the 8% ABV of Burton IPA, the Coopers beer is more akin to the lighter bottled pale ales which started to appear in the domestic UK market from around 1870 onwards. By that time the terms IPA and pale ale were synonymous — in fact market leader Bass had already dropped "India" from their label. So the lighter versions were commonly labelled sparkling ale, presumably in reference to clarity and carbonation as a bottled style. Similarly, in Australia, we find numerous sparkling ale brands by late 19th Century, and subsequent record of them elsewhere in the New World as well, particularly Canada, America and New Zealand. However Coopers Sparkling Ale is the only one to have survived in original form.

Apart from alcohol content, the other major difference between IPA and sparkling ale was that the local version had no requirement for dry-hopping as a preservative for export. This is reflected in the Coopers example today, which continues to employ a single bittering addition only.

Another UK term for bottled pale ale which appeared around that time was "dinner ale," as an even lighter version for mealtimes. Similarly, Coopers also produced a Light Dinner Ale, which was relaunched in the late 1980's as Coopers Original Pale Ale. At 4.5% ABV, this version is favored by many homebrewers as a more practical quaffer than its big brother, Sparkling Ale. For the purposes of Australian homebrew competitions, the style parameters have been extended to accommodate lighter versions. Consideration is currently being given to the name "Australian Pale/Sparkling Ale," to reflect their historical inter-changeability in Australia, and in recognition of the two closely related contemporary examples. For those interested, the full style description is available at www.aabc.org.au.

COOPERS SPARKLING ALE TODAY

Coopers ales remained virtually unchanged for most of the 20th Century, as successive generations of the Cooper family strived to maintain traditional brewing practices. Still in use as late as the 1970's and 80's were coolships, open fermentation in wooden vats using the original multi-strain yeast and maturation in oak casks. By the mid-1980s, these unique ales were enjoying a renaissance as "boutique beers," and steadily increasing demand saw Coopers finally embark on a program of modernization, culminating in complete relocation to a new state of the art brewery in 2001. Improved process control has led to technical improvements in the beer, most noticeably clarity — after almost a century and a half, Coopers Sparkling Ale is finally sparkling! However the basic 19th Century formulation has been preserved, with only minor recipe adjustments as beer ingredients themselves evolved.

Australian pale malt today is prepared almost entirely for use in mainstream pale lagers, and as such is almost certainly paler than the domestic pale malt available in colonial times. Coopers Sparkling Ale today retains its traditional amber color with a touch of crystal malt, but not enough to contribute

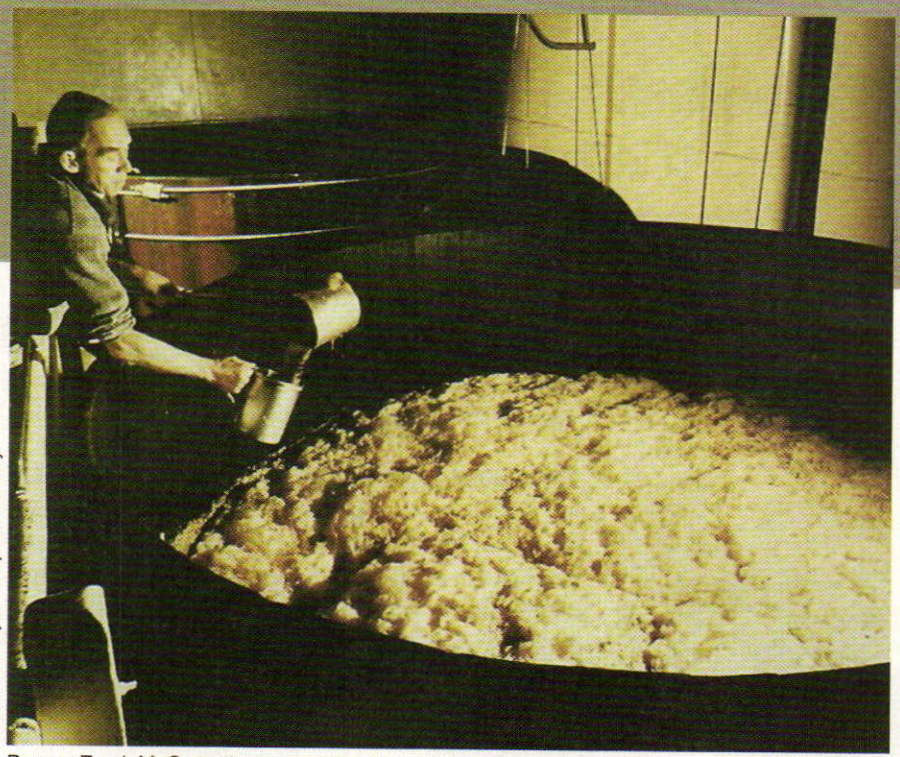
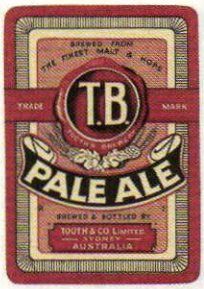


Photo courtesy of Coopers Brewery

Brewer Frank McCue takes a sample of beer from an open wooden fermenter at Coopers. The yeast used at this time was a multi-strain mix. Now a single strain is used.

In the late 19th Century, there were many Australian beers labelled "Sparkling Ale." These were frequently lighter versions of pale ales or India pale ales. Although all these beers shared some similarities, sparkling ales were generally lower in alcohol and not dry hopped. Coopers Sparkling Ale shows a high degree of attenuation, and correspondingly dry finish, compared to most English-style pale ales.



any significant caramel flavors. A proportion of wheat malt is also used. Cane sugar was used extensively in colonial times, as a necessity to dilute excessive protein levels in low-grade domestic pale malt. As malt quality improved however, Coopers ales resumed their original all-malt formulation, as brewed initially by Thomas Cooper using imported English malt. Nowadays cane sugar is used only for bottle priming, and if necessary, for minor adjustments in the boil to achieve "sales gravity."

Colonial brewers used a range of hops, both domestic and imported. Nowadays, Coopers use Pride of Ringwood — the definitive Australian hop developed in 1959 by CUB (Carlton and United Breweries), at their hop research facility in the Melbourne suburb of Ringwood. Pride of Ringwood is a high-alpha hop (at the time the world's highest), typically around 9–11% AA, and is used in all mainstream Australian beers. It is generally considered somewhat coarse in flavor and bitterness, so you only need about 30–35 IBU in this style. As John Palmer pointed out in his presentation at the recent Australian National Homebrewing Conference, perception of bitterness depends on "bitter stuff," not just alpha acids, so the numbers don't tell the full story. Pride of Ringwood is a cross-cultivar of a Tasmanian wild hop and an English hop (Pride of Kent), and the wild hop seems to dominate. Even with just a bittering addition, Pride of Ringwood lends a distinctive flavor note in pale beers — variously described as peppery, herbaceous or even woody.

Coopers original yeast underwent some cleaning up in the mid-1980s to improve flocculation and is now a single strain. However, it retains its Burton-style attenuative properties, and extensive trials ensured its unique flavor profile was maintained. As always, the same strain is used for primary fermentation and bottle conditioning. Coopers today employs reverse osmosis water treatment, with subsequent mineral salt addition as required. For pale ale, the obvious choice is calcium sulfate.

LET'S GET BREWING!

The first thing we need to do is buy some Coopers yeast. It's the cheapest yeast in town, and you get free beer with every purchase! As Coopers says, "We encourage homebrewers to reactivate yeast from our commercial ales to use in their brews." Following is a simple method, requiring one bottle only:

Pour the beer into your glass in one hit, leaving the dregs in the bottle. Swirl it around to rouse the yeast sediment and release the CO_2 in the remaining beer. Pour in a little bit of wort — no more than about 2 inches (50 mm) in the bottom. No need to oxygenate because we're only looking to reactivate the yeast, not grow it. Place some Glad Wrap or aluminum foil over the opening.

Incubate the yeast at around (77 °F) 25 °C for 24 hours. This is usually plenty, and you'll know it's ready by the foam generated when you swirl the contents.

Pour your activated Coopers yeast into a starter bottle containing about a quart (1 L) of pale wort, and oxygenate by shaking vigorously. Incubate at around (77 °F) 25 °C for pitching at high-kräusen (usually 24–36 hours).

The grain bill provided in the all-grain recipe is a proven one, but there are plenty of similar malts which work equally well. Naturally, you may have to adjust the quantities to achieve the appropriate amber color. When mashing for this style, it's critical to produce a highly attenuable wort. Any proven mash regime for highly attenuated styles is fine — such as a single infusion mash at 148–150 °F (64–66 °C) or a step mash with a rest in the 140–145 °F (60–63 °C) range — or you can try the one on page 46. It's my own standard routine for such beers, and while it's a little unorthodox, it's well proven.

Make a thin mash, 1.5 qts./lb. (3 L/kg), and stir it every 10–15 minutes. Mash in at 153 °F (67 °C) for 15 minutes, then reduce to 145 °F (63 °C) with cold water addition. Hold for 90 minutes, or allow to fall to around 140 °F (60 °C). Don't mash out, just sparge slowly with 145 °F (63 °C) water. Boil for 90 minutes, adding hops at the start. Chill to 68 °F (20 °C), whirlpool to coagulate the cold break, allow to settle covered for an hour or so, then rack into your fermenter. Pitch and ferment at 68 °F (20 °C), ramping up a few degrees towards the end to ensure full attenuation.

Primary fermentation will be over in 3 or 4 days, however it's wise to allow another day or two for acetaldehyde reabsorption (green apple). Never rack into secondary and bottle after no longer than 6 days in primary, otherwise the yeast count may drop below ideal for bottle conditioning. Bottle prime with cane sugar, sufficient to produce about 3.5 volumes of CO_2 after refermentation. Coopers primes their kegs with sugar just like their bottles, so if you're kegging your beer you may want to do this too, rather than force carbonation. Condition your bottles or kegs at 68 °F (20 °C) and they should be well carbonated within a week. Pitch to pour in 10 days, Australian pale ale is

certainly a "present use" style! Thanks to the absence of late hopping, it doesn't need time to mellow out like the hoppy pale ales often do. However, experience shows that the beer will benefit from a few weeks maturation.

EVALUATING YOUR COOPERS CLONE

If you're familiar with Coopers Sparkling Ale, then your palate will tell you how close you are to the mark. But it still helps to understand the structure of this beer, because it's quite different from other pale ale styles. First and foremost, your hydrometer will tell you if you've achieved the all-essential attenuation. You really do need to get your FG close to spec to achieve the light, dry, refreshing character that typifies the beer. And, with that sort of attenuation, you need to keep your carbonation very high, otherwise it can seem a bit lifeless and watery. Secondly, your beer color will tell you whether you've got the crystal malt right — anything much past amber will be too malt-accentuated.

Thirdly, in the absence of genuine late hop character, the yeast will need to step into the gap, otherwise it will be a very bland beer indeed. So you need plenty of fruitiness and, depending on pitching rate and fermentation temperature, Coopers yeast can generate apple, pear, banana or even a tropical fruit salad impression with noticeable citrus, often grapefruit. Extreme fruit character can be interesting, but a refined pear-like fruitiness is more typical of the Coopers example today, with little or no banana. As well as the fruitiness, any beer brewed with Coopers yeast will display a signature aroma — usually described as bready, yeasty, earthy or even potato sack! It's certainly distinctive and definitely quite rustic.

Fourthly, as with any style, it all needs to balance. The fruitiness, yeasty/bready aromas and mild peppery hop note should all be present, and together they deliver quite a bit of complexity up front, as long as you don't overdo the crystal malt. There should be a brief initial malt sweetness, but then a solid bitterness should kick in. Aftertaste should be a pleasant balance of fruitiness and pale malt flavor, and the finish should be long and dry, begging the next draught.

RECIPES

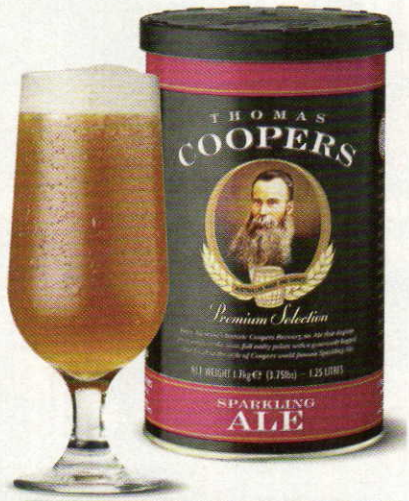


Photo courtesy of Coopers Brewery

Coopers produces a Sparkling Ale beer kit in their Premium Selection line. The brewery suggests adding this kit to 1 can Coopers Light Malt Extract, 1.1 pounds (500 g) Coopers Light Dry Malt Extract, 10.6 oz. (300 g) Coopers Dextrose, Coopers Yeast and enough water to yield 6 gallons (23 L).

Coopers Sparkling Ale clone

(5 gallons/19 L, extract with grains)

OG = 1.045 FG = 1.005
IBU = 35 SRM = 8 ABV =5.8%

Ingredients

14.4 oz. (408 g) Joe White Pilsener malt
10.6 oz. (300 g) Joe White wheat malt
7.0 oz. (200 g) Weyermann CaraRed®
1.0 lb (0.45 kg) Coopers Light dried malt extract
4.0 lb. (1.8 kg) Coopers Light liquid malt extract
10 AAU Pride of Ringwood hops (1.1 oz./30 g of 9.5% alpha acids)
Coopers yeast (cultured from bottle)
7.0 oz (200 g) cane sugar (sucrose) (for priming)

Step by Step

Steep crushed grains at 148 °F (64 °C) in 3.0 qts. (2.8 L) of water for 45 mins. Combine "grain tea," water and dried malt extract to make 3.0 gallons (11 L) of wort. Boil for 60 minutes, adding liquid malt extract for final 15 minutes of the boil. Ferment at 68 °F (20 °C). Add corn sugar and bottle condition.

Coopers Sparkling Ale clone

(5 gallons/19 L, all-grain)

OG = 1.045 FG = 1.005
IBU = 35 SRM = 8 ABV = 5.8%

Ingredients

7 lb. 11 oz. (3.5 kg) Joe White Pilsener malt
10.6 oz. (300 g) Joe White wheat malt
7.0 oz. (200 g) Weyermann CaraRed®
8.4 AAU Pride of Ringwood hops (90 mins)
(0.88 oz./25 g of 9.5% alpha acids)
Coopers yeast (cultured from bottle)
7.0 oz (200 g) cane sugar (sucrose) (for priming)

Step by Step

Culture yeast from a Coopers bottle. Treat water with calcium sulfate to achieve 115 ppm Ca^{2+} and 280 ppm SO_4^-. (If starting from distilled water, this is approx. 0.5 g/L.) Mash for a highly-fermentable wort. (See the article for options.) Boil wort for 90 minutes, adding hops at the beginning. Ferment at 68 °F (20 °C). Bottle condition, shooting for 3.5 volumes of carbon dioxide. (Note: ABV estimate includes priming sugar.)

- Brew Your Own

Photo courtesy of Coopers Brewery

It goes without saying that for proper evaluation, Australian pale ale should be served without rousing the sediment. When enjoying the style casually, however, you might want to try serving it *mit hefe* (with yeast) — quite a popular practice with Coopers ales nowadays, thanks largely to their "Cloudy but Fine" advertising campaign of the 1990s. Just like a hefeweizen, it softens the mouthfeel and gives an impression of substance, as well as enhancing some of the fruity/yeasty flavors. So if your beer is lacking a bit in these areas, or you just fancy a vitamin boost, go right ahead!

Summing up, this is a beer that demands to be appreciated on its own terms — to ask for more hops is to misunderstand the style. As a 19th Century style it can be considered basic, but basic doesn't mean rudimentary. There's quite a lot of craft in taking the cheapest domestic ingredients available, and combining them in the simplest of all brewing processes, to produce a well-balanced, flavorful beer that's not only full of character, but highly quaffable at nearly 6% ABV. So beware not to underestimate this classic — in more ways than one!

Tony Wheeler is an Australian homebrewer.

by **JOHN PALMER**

It's a mash tun . . . and a brew kettle? Using the brew-in-a-bag method of Australian homebrewers, one vessel can serve both purposes. A large bag is draped over the vessel (top left) and the grain is stirred in. The mash rests (top center), then — once the mash is converted — the bag is lifted (top right) and the wort is boiled. As an option, the hot wort may be racked to a "cube" and allowed to cool overight. Some brewers even practice no-boil hopping in the cube.

australian homebrew TECHNIQUES

IF I TRY TO PICK out the one thing from my trip a few months ago to Melbourne for the Australian National Homebrewing Conference (ANHC) that really stood out for me, it was that good beer was good beer. I judged at their first annual National Homebrew competition, and I wanted to point this out before we delve into three techniques from Downunder, the radical — if not potentially heretical — brewing practices of brew-in-a-bag, no-chill cooling and no-boil hopping. I am not trying to give you the raw prawn, this is the good oil. The Australian brewer likes to make up his own mind, to prove it to himself, and not take someone else's word for it. The Aussies are great innovators and seem to have the doctrine, "That sounds too complicated, I betcha it would work like this..."

The Aussies are great innovators and seem to have the doctrine, "That sounds too complicated, I betcha it would work like this..."

OVERVIEW

In a nutshell, the Aussie brew-in-a-bag method consists of lining a 10-gallon (38-L) pot with a nylon or polyester mesh bag, adding enough water to account for grain absorption and the pre-boil volume. The grain is poured into the bag-lined kettle and stirred to start the mash.

When the mash is over, the bag is lifted from the wort and allowed to drain. The wort is then boiled with hops as usual.

The no-chill method consists of transferring the boiled wort to a sealed container – hot. The hot wort sanitizes the container, and the wort is allowed to cool overnight.

EQUIPMENT

The Bag: The brew in a bag system utilizes a large polyester mesh bag that is as large or larger than the brewpot. The mesh is very fine, like "voil" or "chiffon," and can be purchased at a fabric store and sewn as a large pillow case.

The bag should be large enough to fold over the rim of the brewpot to allow easy stirring. It also needs to be strong – 10 lbs. (4.5 kg) of dry grain weighs about 20 lbs. (9.1 kg) when wet.

The Pot: The brewpot needs to be large enough to contain all of the water used for the batch. A rule of thumb is that the pot needs to be about twice the batch size. For example, a 5.0-gallon (19-L) batch of 1.054 OG beer would use about 10 lbs. (4.5 kg) of malt at 75% efficiency. The water retention factor is lower than in conventional mashing, due to more drainage, about 0.3 quarts per pound of malt (0.6 L/kg), so about 0.75 gallons (2.8 L) would be retained by the mash. If you wanted to boil 6.5 gallons (25 L) of wort to obtain 5.0 gallons (19 L) in the fermenter, you would need to mash with about 7.25 gallons (27 L) of water, and have a total mash volume of about 8.0 gallons (30 L).

The Cube: The wort storage container (and often fermenter) is a large re-sealable jerry can made from high density polyethylene (HDPE). They are available in Australia from hardware and outdoor stores in 15, 20, and 25 liter sizes for about 15–20 dollars. Here in the US, the typical size is 5.0 gallons (19 L) and one online source is usplastics.com.

THE METHOD

Heat the water in the brewpot to strike temperature. Turn off the heat and place the bag in the pot, draping the top of the bag over the sides. Stir in the grain quickly using a mash paddle to break up clumps and ensure that all the grain is thoroughly wetted. Check the mash temperature and adjust as necessary. If you need to add heat, you must stir the mash continuously to ensure that the temperature rise in the mash is homogenous.

Cover the brewpot with a lid and let the mash rest for at least an hour. This mash is more dilute than most mashes, especially if adjuncts are being used. You can wrap the brewpot with insulation if you wish, but with this much thermal mass, the temperature drop is usually only a couple degrees over the hour.

After an hour, the mash should be raised to mashout temperature, 170 °F (77 °C), for best results. The reported efficiency for this process is 75–80%, with lower gravity beers being more efficient. Stir continuously to prevent the mesh bag from scorching or melting on the bottom during heating.

At the end of the mash, gather the top of the bag together and lift it just out of the water to allow it to drain. The bag can be washed and re-used.

Next, conduct the boil. No recirculation or sparging is necessary with the brew-in-a-bag method. When the boil is complete, you have the choice of using the no-chill method of wort cooling or not. For the no-chill process, whirlpooling is recommended to separate the majority of the hot trub from the wort before racking it to the cube.

When the container is full, gently tip it up and squeeze all the air out. Remember that the wort is boiling hot! Do not overtighten the lid. The container should be sanitized before you fill it, but it's a good idea to tip it on its side while hot to further sanitize the lid with heat as it cools.

Australian brewers report that this method saves them an average of two hours from a typical all-grain brewing day, mainly due to the lack of sparging and the reduced cleaning of the single vessel. The sealed wort can be kept for several weeks before fermentation without contamination. The wort should be stored chilled if possible to reduce wort darkening.

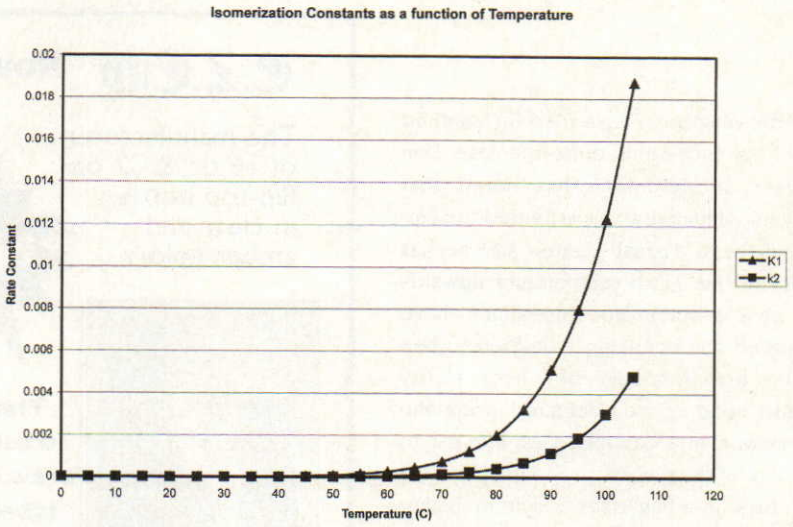
BUT WHAT ABOUT...?

The brew-in-a-bag and no-chill concepts seem like they would result in at least three problems: poor conversion due to enzyme dilution, clarity problems due to lack of a vorlauf or recirculation step, and clarity or chill haze problems from the slow cooling. However, the experiences of

the brewers whom have tried this method have not shown this to be the case. Dan Walker of Melbourne has noted that several of his brews have tended to over-attenuate to a small degree and he has adjusted his mash temperature upwards to compensate. No Australians have reported any beer clarity problems when using brew-in-a-bag, but beer clarity would need to be compared using the same wort in a controlled experiment to be sure of the results.

Brew-in-a-bag does result in higher wort turbidity (cloudiness) and the retention of all the cold break into the fermentation. But, a review of the technical literature shows that this could be beneficial to fermentation performance and may be beneficial to overall beer quality as well. A fairly recent paper by F. Kuhbeck et. al., sums up the situation well. In their paper "Influence of Lauter Turbidity and Hot Trub on Wort Composition, Fermentation, and Beer Quality," *Journal of the* ASBC, 64(1)16-28, 2006, Kuhbeck and his colleagues at the Technical University of Munich at Weihenstephan determined that turbid wort — 5–6 times that of the normal clear-lautered wort (per EBC test) — performed better than clear wort in several respects. The overall result of these investigations was that increased wort turbidity due to higher lauter turbidity and lack of hot trub removal may simplify brewhouse operation (faster lautering process and whirlpool operation), may increase fermentation performance and does not lead to significant deterioration of flavor quality, flavor stability or foam stability. Of course, the degree in turbidity of the brew-in-a-bag wort may exceed the degree of turbidity in the study, so it's hard to know if their results apply to this situation. Again, head-to-head testing with standard methods would be needed.

The risk of hot side aeration would seem to be another pitfall of these methods, but a recent Brew Strong podcast with Dr. Bamforth addresses that concern too. He agreed during the interview that proteins, melanoidins and other wort compounds can and will be oxidized during the mash and lauter, but his research into oxidation and beer flavor stability has shown him that a healthy fermentation will correct much of what happens upstream in wort production. The primary factors for



This graph shows derived isomerization constants as a function of temperature. These indicate that, in theory at least, some isomerization occurs at sub-boiling temperatures.

beer flavor instability are oxygen in the package (bottle) and storage temperature. Again, these statements may seem to go against all of the do's and don'ts that we as beginning brewers learn, but they do make sense in the larger context. And, as with the issue of turbidity, only head-to-head testing could demonstrate the level of hot-side oxidation in brew-in-a-bag worts and if this oxidation was partially or totally countered by running a healthy fermentation.

Another innovation that is being practiced with no-chill brewing is no-boil hopping. Over the past year, a lot of Australian brewers have been experiencing higher-than-anticipated bitterness in their no-chill beers. They have wondered about the possibility of increased isomerization of late hop additions and "cube additions"

due to the near boiling temperatures as the wort gradually cools down. The cube additions can be likened to the effect of putting hops in a hopback, or added to the whirlpool at a commercial brewery, but it differs in that the contact time is much longer. Matt Brynildson, brewmaster for Firestone Walker Brewing Company in Paso Robles, California, estimates that whirlpool hopping contributes about 40% of the bitterness of kettle hopping.

A paper by M. Malowicki and T. Shellhammer in the *Journal of the* ASBC 64(1):29-32, 2006, gives experimentally derived equations for the alpha acid isomerization rate constants K1 (for isomerization) and K2 (degradation) at near-boiling temperatures. The curves, shown on page 52, suggest that isomerization is substantial at 95–100 °C, but below 70 °C, the isomerization constant K1 has decreased to 1% of its value at 100 °C.

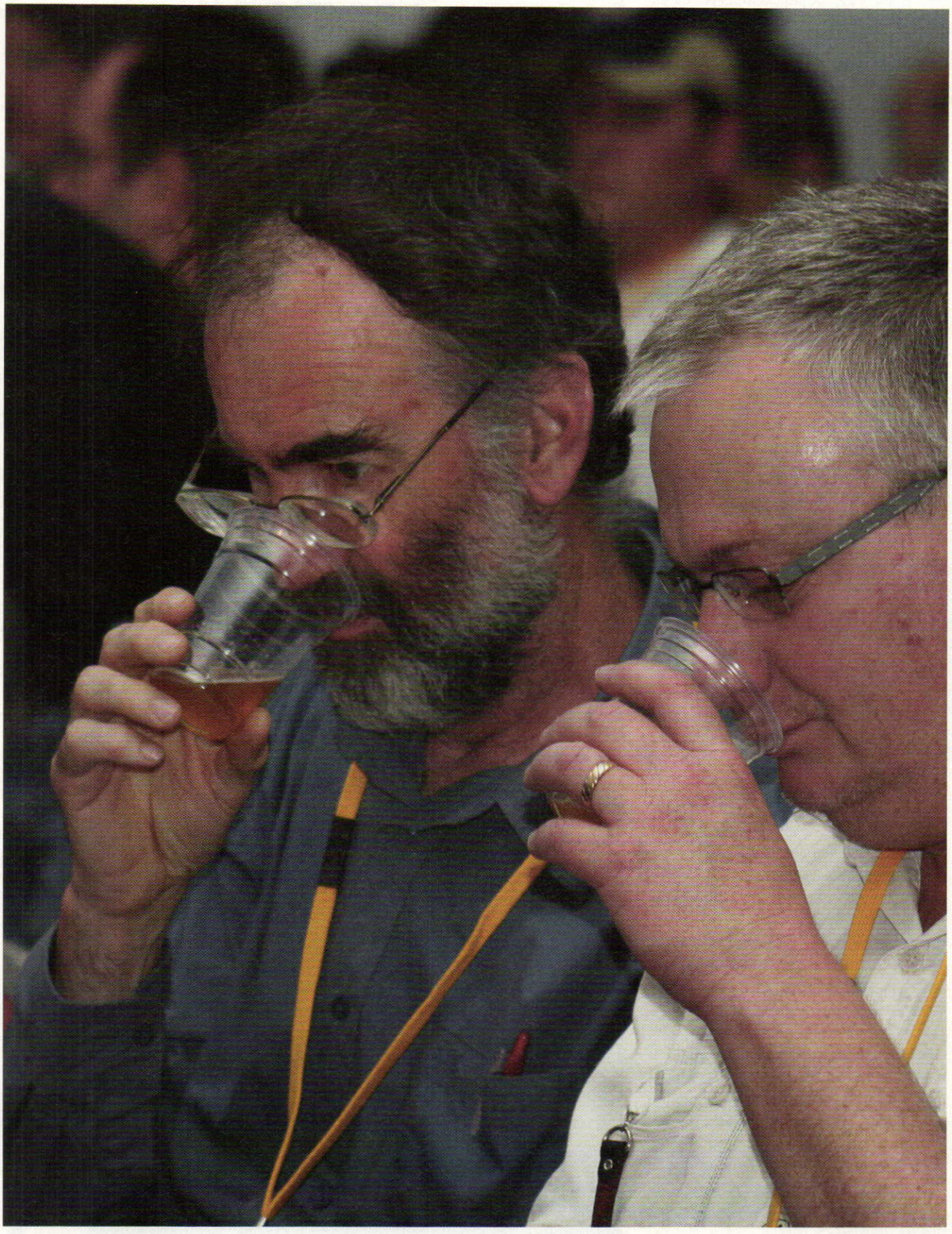
An experiment by Dan Walker indicated that a cube hopped beer had higher bitterness, slightly more hop flavor, and slightly less hop aroma than the same beer made with 60 minute, 10 minute, and flame-out additions targeting the same total IBUs. In fact, all three experimental tasters said they preferred the cube-hopped beer, describing it as more complex and full in its flavors. Other brewers have reported different results and preferences in their own brewing, but the fact remains that cube-hopping contributes bitterness to beer.

SUMMARY

There are many ways to squash a cane toad, and many ways to brew good beer. In fact, many award-winning beers in Australian competitions have been brewed using these methods. The science of brewing is to determine what the process variables are for each process and the consequences of manipulating them. The art of brewing is to decide how to best combine brewing processes to produce the desired beer. This look at some unusual Australian brewing processes is intended illustrate the brewer's art, not overturn it. I look forward to drinking more good Australian homebrews in the future.

John Palmer is Brew Your Own's *Advanced Brewing columnist.*

by **ANDREW DAVISON**



winning recipes from AUSTRALIAN brewers

Here are the top seven scoring category winners in the Australian Amateur Brewing Championships (AABC). These have been adjusted, when necessary, to fit BYO's standard assumptions for extract efficiency and hop utilization. (If so, only the amount of pale malts and bittering hops were changed.) Look for three more winning Australian homebrew recipes at www.byo.com.

recipes from the **AUSTRALIAN AMATEUR BREWING CHAMPIONSHIPS** (AABC) - held in conjunction with AHNC, Melbourne, October 23, 2008

Geoff Prince & Michael Jerie (Victoria)

Imperial Stout

(4.75 gallons/18 L, extract with grain)

Champion Beer of Show at AABC 2008, Score: 42.5/50

OG = 1.070 FG = 1.026

IBU = 40 SRM = 43 ABV = 5.8%

"This recipe was constructed for us by John Strantzen, one of Australia's most successful and generous homebrewers. We've been tweaking it for a decade and seemed to be particularly blessed with this batch — it wasn't an easy decision to offer up bottles for judging!"

Ingredients

3 lb. 12 oz. (1.7 kg) Coopers Stout kit
2 lb. 14 oz. (1.3 kg) light dried malt extract
1 lb. 1.5 oz. (0.5 kg) dark dried malt extract
10.5 oz. (0.3 kg) dextrose
5.5 oz. (0.15 kg) corn syrup
7 oz. (0.20 kg) roasted barley
10.6 oz (0.30 kg) crystal malt
5.3 oz (0.15 kg) chocolate malt
8.1 AAU Fuggles hops (90 mins) (1.8 oz./50 g of 4.5% alpha acids)
4.1 AAU Fuggles hops (15 mins) (0.9 oz./25 g of 4.5% alpha acids)
0.9 oz. (25 g) Fuggles hops (2 mins)
Wyeast 1007 (German Ale) yeast

Step by Step

Steep cracked grains at 154 °F (68 °C) in 2 qts. (2 L) of water for 20 minutes. Carefully strain liquid from steep into brewpot avoiding carry over of any husks. Add rest of the fermentables and add water to make 5.3 qts. (5 L). Boil for 90 minutes, adding hops at indicated times. Cool, transfer to fermenter and top up with water to 19 qts. (18 L). Pitch the yeast at 75 °F (24 °C) and let cool slowly during lag phase. Once fermentation becomes active, control temperature at 64 °F (18 °C). The yeast produces a huge head, so make sure there is plenty of head space in the fermenter. Bottle after one month. Age at judging was 2 years.

Michael Carter (Queensland)

Belgian Strong Ale (6 gallons/23 L, all-grain)

Score: 42/50
OG = 1.072 FG = 1.011
IBU = 31 SRM = 3 ABV = 7.9%

"This was my first Belgian Ale. I had no spare fridge space, so it was fermented at ambient temperatures, getting up to 86°F (30 °C) on day 2 and it was all over after 3 days. I didn't really like the beer, but all who tried it thought it was great, and so did the judges!"

Ingredients

11 lb. 12 oz. (5.3 kg) Weyermann Pilsner malt
3.5 oz. (0.10 kg) Weyermann Pale Wheat malt
3 lb (1.35 kg) demerara sugar
12 AAU Belgian Saaz hops (60 mins) (1.5 oz/40 g of 8.2 % alph acids)
Fermentis Safale T-58 dried ale yeast (2 packets)

Step by Step

Single step infusion mash in 18 qts. (17 L) water at 149 °F (65 °C) for 60 minutes, then 169 °F (76 °C) for 10 minutes. Boil for 90 minutes, adding hops at indicated time. Cool, aerate and add yeast. Ferment at 79 °F (26 °C) for 7 days. (See blurb, though.) Rack to keg with gelatine fining. Carbonate to 4 volumes, lager for 4 weeks at 39 °F (4 °C). Bottle from keg.

Extract with grains option:

Reduce Pilsner malt to 1 lb. 13 oz. (0.81 kg) and add 2.0 lbs. (0.91 kg) light dried malt extract and 4.5 lbs. (2.0 kg) light liquid malt extract. Steep grains in 3 qts. (2.8 L) of water at 149 °F (65 °C) for 45 minutes. Combine "grain tea," dried malt extract and water to make 3.5 gallons (13 L) of wort. Boil 60 minutes, adding liquid malt extract for final 15 minutes of boil. Ferment and condition as described in all-grain recipe.

Geoff Daly (Victoria)

Black Velvet Stout (5.8 gallons/22 L, all-grain)

Score: 42/50
OG = 1.058 FG = 1.020
IBU = 28 SRM = 55 ABV = 5.1%

"I'd like to dedicate this beer to my wife Samantha for putting up with all the brew gear in the bedroom."

Ingredients

10 lb. 4 oz. (4.7 kg) Joe White pale malt
2 lb. 3 oz. (1.0 kg) Joe White dark Munich malt
1 lb. 1.5 oz. (0.50 kg) Joe White roasted barley
10.5 oz. (0.30 kg) Joe White chocolate malt
9 oz. (0.25 kg) flaked barley
9.1 AAU Target hops (60 mins) (0.91 oz./26 g of 10% alpha acids)
Fermentis Safale US-05 dried yeast

Step by Step

Single step infusion mash at 154 °F (68 °C) for 90 minutes, then 171 °F (77 °C) for 5 minutes. Boil for 90 minutes, adding hops for 60 minutes at indicated time. Cool, aerate and add yeast. Ferment at 68 °F (20 °C) for 13 days.

Lyndon Wilson (South Australia)

American Rye IPA (7.7 gallons/29 L, all-grain)

Score: 42/50
OG = 1.065 FG = 1.015
IBU = 70 SRM = 10 ABV = 6.5%

"The recipe was inspired by a fellow brewer. The spicy character of the rye really makes this beer as it balances beautifully with the strong malt and hop flavors."

Ingredients

11 lb. (5.0 kg) ale malt
6 lb. 9.5 oz. (3.0 kg) Joe White dark Munich malt
3 lb. 5 oz. (1.5 kg) rye malt
7 oz. (0.20 kg) Bairds medium crystal malt
7 oz. (0.20 kg) Caramunich® type I malt
3.5 oz. (0.10 kg) crystal rye malt
6.9 AAU Nugget hops (mash hops) (0.7 oz./20 g of 9.8% alpha acids)
4.9 AAU Nugget hops (60 mins) (0.5 oz./15 g of 9.8% alpha acids)
7.8 AAU Nugget hops (30 mins) (0.8 oz./23 g of 9.8% alpha acids)
6.6 AAU Cascade hops (20 mins) (1.1 oz./30 g of 6% alpha acids)
6.2 AAU Amarillo hops (20 mins) (0.7 oz./20 g of 8.9% alpha acids)
6.6 AAU Cascade hops (15 mins) (1.1 oz./30 g of 6% alpha acids)
6.6 AAU Cascade hops (10 mins) (1.1 oz./30 g of 6% alpha acids)
1.1 oz (30 g) Cascade hops (0 mins)
2.8 oz. (80 g) Cascade dry hop (7days)
Wyeast 1028 (London Ale) yeast (3 qt./3 L starter)

Step by Step

Two step infusion mash in 27 qts. (26 L) of filtered tap water with ½ teaspoon gypsum and the mash hops. Protein rest at

131 °F (55 °C) for 15 minutes, then conversion at 151 °F (66 °C) for 60 minutes. Add 8 qts. (7 L) boiling water and drain off first runnings, then do two separate batch sparges to collect total of 11 gallons (43 L). Boil for 90 minutes, adding hops at indicated times. Final kettle volume 7.7 gallons (29 L). Yeast prepared from small sample in 1.040 starter. Refrigerate starter and at end of chilling, pour off the liquid, add 1 qt. (1 L) fresh wort and pitch into main batch after 4–6 hours when high activity is visible. Primary fermentation for 14 days. Rack to secondary for 7 days with dry hops added. Conditioned at 32 °F (0 °C) for 3 weeks with 1 teaspoon of gelatine added after the 1st week. Bottled 3 months prior to judging.

Craig Webber (Australian Capital Territory)

Maibock
(7.1 gallons/27 L, all-grain)

Score: 41/50
OG = 1.070 FG = 1.016
IBU = 27 SRM = 8 ABV = 7.0%

"Best three tips for new brewers are: join a club, follow the same process each time you brew to learn your system, and only change one thing at a time."

Ingredients

11 lb. 8 oz (5.2 kg) Pilsener malt
9 lb. 11 oz (4.4 kg) Munich malt
11 AAU Liberty hops (60 mins)
(2.5 oz./71 g of 4.2% alpha acids)
Wyeast 2042 (Danish lager) yeast
(5 qt./5 L starter)

Step by Step

Mash at 153 °F (67 °C) for 90 minutes. Boil for 60 minutes with hops added at the start. Ferment at 48 °F (9 °C) until gravity drops to 1.022, then raise temperature to 61 °F (16 °C) until fermented out. Lager for 1 month, keg or bottle and enjoy.

Ross Mitchell (Australian Capital Territory)

English Pale Ale
(5.3 gallons/20 L, all-grain)

Score: 41/50
OG = 1.054 FG = 1.014
IBU = 44 ABV = 5.4%

"The German crystal malts are not traditional but provide richness without the cloying quality of some of the currently available English crystals. The amber invert sugar adds a bit of flavor complexity and helps dry out the finish. Hopping the mash and first runnings worked well for this one – it retained appreciable hop character despite being fairly well aged when judged."

Ingredients

5 lb. 8 oz. (2.5 kg) Baird's Maris Otter pale ale malt
2 lb. 12 oz. (1.25 kg) Powell's ale malt (Australian)
1 lb. 6 oz. (0.63 kg) Barrett Burston Galaxy ale malt (Australian)
11 oz. (0.3 kg) Weyermann Munich II malt
7 oz. (0.2 kg) Weyermann melanoidin malt
4 oz. (0.1 kg) Weyermann carapils malt
7 oz. (0.2 kg) Amber candi sugar (invert)
1.7 AAU Kent Goldings hops (mash hops)
(0.35 oz./10 g of 4.8% alpha acids)
1.7 AAU Kent Goldings hops
(first wort hops)
(0.35 oz./10 g of 4.8% alpha acids)
4.8 AAU Wye Target hops (90 mins)
(0.53 oz./15 g of 9.0% alpha acids)
1.7 AAU Kent Goldings hops (50 mins)
(0.35 oz./10 g of 4.8% alpha acids)
1.7 AAU Kent Goldings hops (10 mins)
(0.35 oz./10 g of 4.8% alpha acids)
Fermentis Safale US-05 yeast (2 sachets)

Step by Step

Mash in with 12 qt. (11 L) water and 8 g gypsum at 126 °F (52 °C) for 20 minutes, then 151 °F (66 °C) for 60 minutes. Boil for 90 minutes, adding hops at indicated time. Ferment at 64 °F (18 °C) for 10 days, condition at 39 °F (4 °C) for 2 weeks. Bottle with kräusen wort, warm condition 2 weeks then store at 39 °F (4 °C). Age at judging: 4 months.

Extract with grains option:

Reduce amount of three base malts to 10 oz. (0.28 kg) pale malt (total). Add 2 lbs. (0.91 kg) light dried malt extract and 4 lb. 6 oz. (2.0 kg) light liquid malt extract. Steep grains in 3 qts. (2.8 L) of water at 151 °F (66 °C) for 45 minutes. Combine "grain tea," dried malt extract and water to make 3.0 gallons (11 L) of wort. Add mash and first wort hops and heat to a boil. Boil 60 minutes, adding 0.59 oz. (17 g) Target hops at beginning of boil. Add liquid malt extract for final 15 minutes of boil. Ferment and condition as described in all-grain recipe.

Michael Meissner (New South Wales)

Bavarian Weizen
(6 gallons/23 L, all-grain)

Score: 39.5/50
OG = 1.050 FG = 1.012
IBU = 16 SRM = 6 ABV = 5.1%

"My philosophy on brewing these days is to keep it simple and allow the ingredients to shine through."

Ingredients

5 lb. 8 oz. (2.5 kg) Joe White wheat malt
4 lb. 6.5 oz. (2.0 kg) Joe White Pilsner malt
1 lb. 1.6 oz (0.50 kg) Weyermann Vienna malt
4.3 AAU Mt Hood hops (60 mins)
(1.2 oz./33 g of 3.7% alpha acids)
White Labs WLP300 (Hefeweizen ale) yeast (2 qt./2 L starter)
9.0 oz. (260 g) corn sugar (for priming)

Step by Step

Mash in with 16 qts. (15 L) water and adjust mash pH to 5.2. Mash at 153 °F (67 °C) for 60 minutes with 3 qts. (3 L) of wort recirculated after ½ hour to even out mash temperature. Sparge to give preboil volume of 8.7 gallons (33 L). Boil for 90 minutes, adding hops at indicated time. Cool to 63 °F (17 °C) and pitch yeast. Vigorous fermentation caused temperature to rise to 66 °F (19 °C) over the course of a week. Remove some of the yeast load and condition in fermenter for one more week before bottling. Prime with dextrose to achieve 3.5–4 volumes CO_2.

Extract with grains option:

Reduce amount of wheat malt to 8 oz. (0.23 kg) and Pilsner malt to 6 oz. (0.17 kg). Add 1.5 lbs. (0.68 kg) dried wheat malt extract and 4 lb. (1.8 kg) liquid wheat malt extract. Steep grains in 3 qts. (2.8 L) of water at 153 °F (67 °C) for 45 minutes. Combine "grain tea," dried malt extract and water to make 3.5 gallons (13 L) of wort. Boil 60 minutes, adding hops at beginning of boil and liquid malt extract for final 15 minutes of boil. Cool, transfer to fermenter and top up to 6 gallons (23 L). Pitch yeast. Ferment, condition and package as described in all-grain recipe.

Story and photos by **CHRIS COLBY**

Wish you could grow hops, but don't have a suitable in-ground location? With a little knowledge of container gardening, you can grow hops virtually anywhere — including your deck, patio or driveway. Growing plants in containers presents some added challenges, but the basic principles of container gardening are straightforward.

Growing hops in a container is possible if you remember four key principles:

1. Plant the rhizome in a large planter, at least 20" (51 cm) diameter or larger.

2. Thoroughly drench the potting mix every time you water the plants.

3. Feed the plants slowly and steadily with low doses of fertilizer.

4. Limit the above-ground growth to what the plants' root system will happily support.

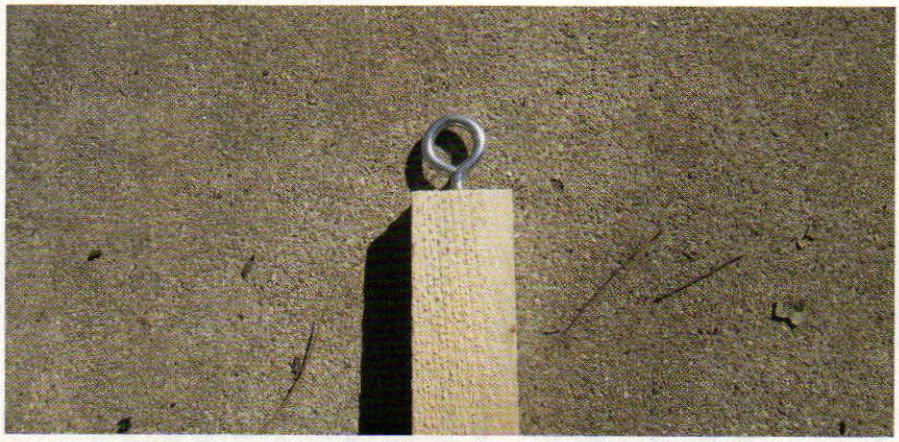
CONTAINER HOP GARDENING

MANY HOMEBREWERS may be interested in growing the hop plant (*Humulus lupulus*), but lack a suitable in-ground space to do so. This leaves the option of growing hops in a container. Growing hops in containers can be a challenge, but — if you understand a few key elements of container gardening — you can grow healthy plants that will yield a bountiful harvest of cones. I've grown hops in containers for four years now and have figured out what it takes. Some folks will say that growing hops in containers can't be done. Then again, the same kind of person will say that about tomatoes, too, and I've grown them successfully in containers for 10 years.

Within the first growing season, the plant's roots will fill the container. Select a planter to give them as much room as possible.

There are advantages and disadvantages to growing hops in containers. The main advantage, of course, is being able to grow hops where you normally wouldn't. And, if you use an adjustable trellis, harvesting the cones is also much easier compared to with a regular trellis. It is also a great way to propagate rhizomes, as first year rhizome growth often exceeds that of in-ground hops.

To build a simple adjustable trellis, all you need is a large stake (for example, this 1" X 2" X 8' piece of wood), a hook and eye and some hop twine (or other strong twine).



The hook and eye screws into the tip of the wood easily. A light tap from a hammer will get it started, then just tighten it by hand. In use, the twine will be threaded through the "eye."

"When growing hops in a container, the biggest shortfall you will need to overcome is the fact that you are cramping the plant's roots."

The primary disadvantage of growing hops in a container is that it takes a bit of work. Likewise, overall growth and crop yield is less than with in-ground hops.

Location

The first thing you need is to scout a suitable location. This can be a porch, patio, deck, driveway, yard or anywhere that gets the right amount of light. To determine this, look around your prospective growing area every hour for an entire day. The pattern of light and shade will change as the sun arcs across the sky. If you live in a prime hop growing latitude, look for a location that gets sun all day long. If this isn't available, find an area that gets as much sun as possible from the late morning to afternoon.

The pattern of sun and shade will also migrate as the growing season progresses and the sun climbs progressively higher in the sky. A nice benefit of growing hops in containers is that you can move them to take advantage of this, if needed.

Required Materials

Once you've selected a spot, you'll only need a few items that can be found at almost any nursery or home and garden center. For starters, you'll need a container. In order to give the roots enough room to spread, you'll need a pot or planter with a minimum 20-inch (51 cm) diameter. When growing hops in a container, the biggest shortfall you will need to overcome is the fact that you are cramping the plant's roots. Everything you do when planting and tending the plant during the growing season will be aimed at mitigating this deficiency.

A simple adjustable trellis can be made from a 1" x 2" X 8' or similarly sized stake, a #6 (or similar) hook and eye and some hop twine. You will also need some regular twine (jute or sissel or whatever works for you). You can also employ any trellis system that works with in-ground hops, for example, stringing hop twine down from the edge of your roof.

Finally, you need a medium to grow the hops in. Even with a large planter, you will be cramping the roots of the hop plant and therefore you need your growing medium to fit this application as best as possible. Specifically, you need a medium with excellent drainage. Ordinary mineral soil — i.e. the "dirt" in your backyard — is a poor choice for this. Instead, use potting mix. This medium, sold at all nurseries and garden centers, provides excellent drainage and is very lightweight when dry. For each 20" planter, you will need a little over 2.0 cu. ft. (0.06 m^3) of potting mix.

Finally, you will need hop rhizomes and some liquid fertilizer. Each planter will hold one rhizome and require up to 2 cups of a balanced all-purpose liquid fertilizer over the growing season.

Preparation

Planting the rhizomes is easy. Begin by filling the planter with potting mix. Add the mix all the way to the top (or even until there is a slight hill). Shake the pot to settle the mix, but do not compact it with

your hands. Over the growing season, the "soil" will compact a little every time you water it. You'll notice this most the first time you water the plant.

Do not put gravel or mineral soil in the bottom of the pot and top up with potting mix — you need the entire container filled with potting mix. (Also, contrary to nearly universal belief, gravel in the bottom of a pot actually hampers drainage.) With a container full of potting mix, you will have a medium that will hold the right amount of water for the plant, but let the rest flow out of the container.

If you choose to use the adjustable trellis I describe, set it up when you plant the rhizome. Adding it later can cause damage to the plant's growing roots. To install the trellis, just screw a hook and eye into the end of a stake and insert this into the pot. Wiggle the stake front to back and side to side, which will create a little space around the wood. Tamp more potting mix into this space to give the stake added support.

Finally, plant the rhizome. To do this, just dig a little trench or hole and plant the rhizome 2 or 3 inches (5.1–7.6 cm) below the "soil." I have planted rhizomes horizontally and vertically and both methods work fine. Replace the potting mix above the rhizome and keep it moist until the first sprouts appear. (You can find a list of rhizome suppliers on page 73).

Growth and Care

Once your hops have been planted, you will need to tend them over the growing season. Even though your planters may look large, the volume that a hop's root system would normally occupy is much larger. As such, your primary goal in caring for your hops is to compensate for this.

First off, however, you'll need to train the growing shoots to a trellis. Commercial growers train 4 to 6 shoots per rhizome to their trellis wires. To partially compensate for the constriction on root volume, I only initially train only two shoots to my trellis wire. I feel it's better to grow two to three healthy, productive vines than more that grow slowly and yield only small cones.

If you use my adjustable trellis idea, just thread the hop twine through the hook and eye and train the shoots to one end. Loosely tie off the other end to the base of the stake. (I'll explain how to adjust this later.)

Start with a large container — don't start small and "up-pot" as the plant grows. Likewise, use only potting mix or soil substitutes that have excellent drainage properties.

Watering

When watering your hop plant, you should think about its root system. You planted a rhizome, a woody, below-ground structure that sends out both shoots — which grow into the above-ground bines — and little white, fibrous roots. By fairly early in your first growing season, these roots will completely fill the container. By late in this growing season, the space the roots occupy will be much less than it would be for an in-ground plant. So, the way you water the plant needs to take this into account.

When I water my hops plants, I make sure to soak their entire growing matrix. I add water until I see it draining from the bottom of the pot. This ensures that every bit of root surface area has access to water. I then wait for the potting mix to almost dry out and repeat. (In the hottest stretches of my summer, when the high temperatures get above 100 °F (38 °C) every day, I need to soak the plants every day.)

Keep in mind that you need to water your hop plants according to their needs, not according to a calendar. Every time you water, you should seek to add it just before the plants really need it. Don't wait until the leaves start wilting to water; instead monitor the top layer of potting mix. When wet, potting mix looks black, but it becomes progressively more grey as it dries. Learn to spot when the planter is running low on water and add water before


A planter with the adjustable trellis installed. It only takes a couple of minutes per planter to get set up.

With regular watering and a steady steam of fertilizer, you can grow two to three (perhaps more) healthy vines per plant that will yield a good crop of full-sized hop cones.

the lack of it begins to stress the plant. Remember that potting mix has great drainage properties, so you really can't overwater unintentionally. As such, I tend to err on the side of watering too often.

This "drench and dry" approach to water is far superior to adding smaller amounts of water on a more regular basis. If you do this, all you're doing is keeping the roots in the top layers of the potting mix wet. The bottom of the planter will dry out and its roots will die back, leaving a reduced amount of root volume to support the above-ground growth.

Nutrients

Plants need adequate sunlight and water to survive, and they also require a small amount of nutrients. When "feeding" a plant, it pays to think again about the plant's roots. In a container-grown plant, you need to supply all the necessary nutrients through a reduced root system. However, adding too much fertilizer can "burn" the plant and actually cause the

roots to die back. The solution is to add a slow, steady stream of nutrients to the plant and disperse these nutrients, as best as possible, throughout the container. The obvious solution here is a liquid fertilizer. Liquid fertilizers are available almost everywhere garden supplies are sold and these are great for all container-grown plants. Compost and manure, while providing excellent nutrition for plants, have poor drainage properties and don't work well when growing hops in containers. Time-release granular fertilizers will also work.

My approach to adding fertilizer is to dilute some liquid fertilizer to one-quarter the recommended strength and soak the planter with this solution. I then strive to add the next feeding right before the plant needs it. Healthy hop leaves look dark green and healthy hop vines will grow steadily throughout the growing season. If your leaves turn yellow or purple or growth slows to a crawl, this is likely a sign that you need to apply some fertilizer.

In a couple years, the hop plant's rhizome will grow too large to be contained in the planter. When this happens, take it out and split it into two or more rhizomes.

The buds on this rhizome will form shoots, and eventually vines.

Over the course of a growing season, a typical container-grown hop plant will use somewhere between ½ and 2 cups of powdered fertilizer mix.

A short spell of nutrient deficiency can be corrected quickly by adding fertilizer, whereas over-fertilization can take longer to correct. As such, I try to add just enough nutrients to keep the plants vigorous and healthy and not overdo it. Adding too much fertilizer will simply spur excessive growth, which the plant's root system will then struggle to support.

Adjustable Trellis

If you set up the adjustable trellis as described earlier, the hop vines will soon grow towards the top of the stake. When they are a few inches below the eye, untie the twine from the base of the stake and feed out a few feet of twine, letting the vine droop a bit. You may need to pull the vine gently downward to get the twine to slide through the hook and eye. Then, loosely tie the twine to the stake again.

As the vine grows, you'll need to feed out more twine every time it approaches the top of the stake. In the part of the season when the vines grow the fastest, you may need to adjust it every week. If you keep making this adjustment, the tips of the vines will always be growing upwards, approaching the top of the stake. The bulk of the vine will eventually be coiled on the ground next to the planter. This doesn't seem to bother the plant, but make sure the leaves don't stay wet or get infested with insects. Once the vine touches the ground, I like to tie a loop of regular twine around the vine and the stake. This keeps the vines from getting whipped around too much when it is windy. A nice benefit of the adjustable trellis is that you can harvest the cones progressively, and they'll all be at an easily reachable height. And if they aren't, just adjust the trellis. Containers eliminate many worries about space. So go grow some hops.

Chris Colby is Editor of Brew Your Own. *A longer version of this article, with further hop growing tips, is available at www.byo.com.*

Taking Control

How to maintain fermentation temperatures

by Jon Stika

Controlling the temperature of actively fermenting wort can have a major impact on the flavor of the finished beer. Fermenting above the normal temperature range may produce excessive fruity-flavored esters or harsh-flavored fusel alcohols. I once brewed a batch of ale during the summer and allowed the fermentation temperature to exceed 80 °F (27 °C). The finished beer tasted like a batch of Juicy Fruit gum!

Photo courtesy of MoreBeer!

Maintaining both warm and cool fermentation temperatures is made easier with a glycol-jacketed conical fermenter.

Most homebrewers do not possess a sophisticated means to maintain fermentation temperatures in a suitable range. This is the reason that historically many beers that needed to be fermented in a cool environment (particularly lagers) were brewed during the winter months and stored in caves or cellars. This is also why I ferment ale in the winter and mead in the summer, when my basement is in the proper temperature range for each type of fermentation.

Normal ale fermentation temperatures range from 68 to 72 °F (20 to 22 °C) and lager fermentation temperatures from 45 to 55 °F (7 to 13 °C). Also keep in mind that the heat generated by an active fermentation can warm a typical 5-gallon (19-L) batch of beer by 10 to 15 degrees Fahrenheit (5.5 to 8.3 degrees Celsius). Even though a basement in a northern climate may be cool enough to keep ale fermentation from overheating, it is often not cool enough to properly conduct lager fermentation. On the other hand, fermenting below the normal temperature range for a given yeast strain may result in a sluggish or incomplete fermentation. So what if your brewing area does not hold a desirable fermentation temperature during the time you wish to brew? Following are a number of techniques to help manage fermentation temperatures that vary from the simple to the sophisticated.

Keeping it cool

A simple way to help cool your fermenting wort is by employing evaporation, the same way our bodies cool themselves on a warm day. Rather than allowing the wort itself to evaporate, place the fermenter in a large tub or pan of water and cover it with a t-shirt or other material that can wick the water out of the pan and let it evaporate from the outer surface of the fermenter, cooling it in the process. This method works best when the air surrounding the wet t-shirt is dry and/or circulated by a fan, allowing for increased evaporation of the water. Evaporative cooling using this technique can keep a fermenter approximately 5 to 15 degrees Fahrenheit (5.5 to 8.3 degrees Celsius) cooler than the surrounding air.

A somewhat more aggressive approach to keeping your fermentation cool is to add ice to the water surrounding the fermentation vessel. This technique requires a little more monitoring to be sure ice is replenished as it melts throughout active fermentation. This method also makes it difficult to control the temperature of the fermenting wort in an ice water bath, resulting in a situation where the wort might be kept cooler than desired. A little experimentation may be necessary to determine if evaporative cooling and/or ice water cooling provides the proper temperature range for your brewing environment. A self adhesive temperature strip placed on the outside of a fermenting vessel above the level of an ice water bath can provide a simple and convenient means of monitoring wort temperature during fermentation.

If the wet t-shirt and/or ice bath approaches prove insufficient to keep your fermentation in the proper temperature range, or won't give you enough control, there are more advanced methods you can employ to get the job done. By setting up a recirculating pump in a separate container holding ice water (an insulated cooler works well) and pumping the chilled water to a bath surrounding your fermenter, you can achieve more control than with a simple ice water bath surrounding the fermenter. By adjusting the rate of flow or size of the water bath surrounding the fermenter you may be able to keep things cool without overdoing it.

To provide even more control to a recirculating cold water system, you can add a temperature controller with a temperature sensing probe. The temperature controller can be used to control the recirculating pump so it will pump cold water around the fermenter whenever the temperature of the fermenting wort rises above the desired temperature. Stopper thermowells are available to house a temperature sensing probe so it can be immersed in a carboy or fermenting bucket. A thermowell is simply a tube, often stainless steel, which is open on one end. The closed end of the thermowell is immersed in the liquid and the temperature-sensing probe is slid down inside the thermowell. This sort of control system can make your setup truly automatic except for keeping the ice water bath stocked with ice.

The same temperature controller can also be used to simply control the temperature inside a refrigerator or freezer.

The temperature controller is plugged into a power outlet and then the refrigerator or freezer is plugged into the controller. The controller's probe is then taped to the side of the fermenter or placed inside a stopper thermowell that is immersed in the wort. The thermostat can then be set to keep the refrigerator or freezer in a temperature range for the style of beer being fermented or the stage of conditioning (lagering) desired.

Temperature controllers come in both analog and digital models and have between a 1 and 4 degree Fahrenheit (0.5 to 2.2 degree Celsius) differential respectively, thus keeping the system they control in a 2 to 8 degree Fahrenheit (1.1 to 4.4 degree Celsius) temperature range. A temperature controller is necessary to keep the cooling system from running colder than the desired fermentation temperature. Temperature controllers are readily available to buy from homebrewing suppliers in the $50 to $100 price range. If employing a refrigerator or freezer for fermentation temperature control, it must be large enough to hold your fermenting vessel and be available for the job for the time required. Used refrigerators and freezers can often be acquired relatively inexpensively and only run when needed for fermenting or conditioning a batch of beer.

"Even though a basement in a northern climate may be cool enough to keep ale fermentation from overheating, it is often not cool enough to properly conduct lager fermentation."

You can also make your own homemade icebox chiller, such as one based on a design by Ken Schwartz, that utilizes jugs of ice to cool air that is circulated in an insulated box where a fermenter is kept. This arrangement utilizes a computer fan to provide air circulation and a thermostat for temperature control inside an insulated box made of rigid foam insulation. Plans for the "Son of Fermentation Chiller" can be found on the Web at http://home.roadrunner.com/~brewbeer/chiller/chiller.PDF .

Keeping it warm

During certain times of the year a garage or basement brewery may not be warm enough for ale or mead fermentation. It then becomes necessary to invent ways to

keep a fermentation warm without spending the energy (and money) keeping the whole house or brewing area at the proper temperature.

Perhaps the easiest method to warm a fermenter is to cover and wrap it with a blanket or other insulating material to retain the heat produced by the fermentation. A self-adhesive thermometer strip makes monitoring the temperature of the fermenting vessel simple.

If conserving the heat produced by the fermentation is not enough, there are also ways to add heat to the system. In the past, I have used an inexpensive submersible aquarium heater to warm water held in a large tub in which my carboy was placed. A self adhesive thermometer strip on my carboy allowed me to monitor the temperature as I adjusted the thermostat on the aquarium heater to achieve the desired temperature.

The flip side of using an insulated box (such as the Son of Fermentation Chiller mentioned earlier) to keep fermentation cool is to rig a light bulb inside the box to keep it warm and control the light by means of a temperature controller. Care must be taken to be sure the hot bulb will not contact any surface that could melt or catch fire.

For a few dollars more, there are products such as the Fermwrap, a flexible electric heating jacket that supplies heat over its entire surface area and is therefore safe to use on glass carboys or plastic buckets. The Fermwrap will typically raise

A digital temperature controller (below) is useful for maintaining fermentation temperatures. They are often used in conjunction with a stopper thermowell and fermwrap heater as seen in the thermowell fermentation kit (above).

Photos courtesy of Northern Brewer

the temperature of a five-gallon (19-L) batch an additional 10 degrees Fahrenheit (5 degrees Celsius). Additionally, the Fermwrap can also be coupled with a temperature controller and stopper thermowell to control the temperature with more precision as per the photo on page 67.

Shoot the moon

If money is no object, you can go for the ultimate in temperature controlled fermentation with a glycol-jacketed conical fermenter with self-contained cooling and heating capability such as the model pictured on page 65 for $1,500 to $2,500 (I can dream, can't I?). These units are thermostatically controlled to cool or heat the wort as needed to control the temperature in a narrow range. Some models are programmable to ferment, perform a diacetyl rest, then lager. If you would like to try building your own glycol-jacketed conical, look for the plans in a future issue of *Brew Your Own*.

Whatever method you choose to control temperature during fermentation, it will be time and money well spent. The yeast that you use, and the environment it has to work in, has arguably the greatest impact on beer flavor of any part of the brewing process. There are many special and style-specific strains of yeast now available to the homebrewer. Each strain has a temperature range where it performs best. Managing fermentation temperature to get the most from a particular strain of yeast can move your brewing up to another level, or allow you to explore new styles of beer that you may not have been able to brew before.

"The yeast that you use and the environment it has to work in, has arguably the greatest impact on beer flavor of any part of the brewing process."

Jon Stika is an avid homebrewer from Dickinson, North Dakota — the land of notoriously chilly winters. He writes "Techniques" for every issue of Brew Your Own.

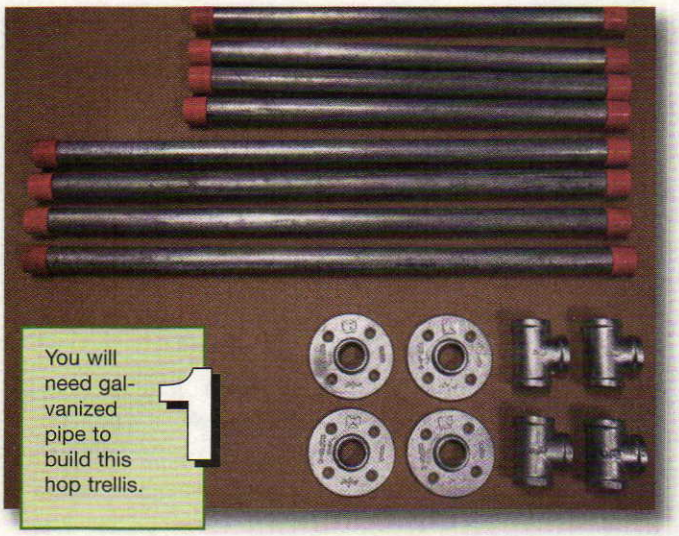
Web extra:

Fermentation troubles? Check out BYO's new troubleshooting chart at:
byo.com/resources/troubleshooting

Home Hop Trellis

Build a system that is harvest-friendly

Story and photos by Andy Sparks



You will need galvanized pipe to build this hop trellis. 1

I had been homebrewing for about a year when I first got the bug to try my hand at growing my own hops. A good friend and one of my homebrewing mentors, Dave Justice, was growing a few varieties in his backyard. I loved the bright fresh aroma that came from the fresh picked cones. As he showed off his plants to other homebrewers and aspiring hop growers he would pick a few cones and show us how to rub them in our hands to capture the fresh aroma. I was smitten; I too was going to grow my own hops. I quickly found a mail order supplier for hop rhizomes and had a few on their way.

Something you should consider when designing a hop trellis for your yard is that hops like to grow very tall and straight up. They can be trained to grow on things, but left to their own devices they want to grow up and they do so very quickly.

Commercial hop farms use rows of very tall unfinished poles — sometimes as much as 20 feet (~6 m) tall, with wire cable running along the tops of each. At the end of each row of poles they use guy wires to keep everything tight and secure. Along the row, at each planting site, they attach a piece of twine for the plant to grow straight up. Since hop trellises are typically tall structures, you should also make sure that the area you are considering for your hop yard is free of any overhead power cables.

I knew there was no point even bringing up the idea of building a commercial-style trellis in our front yard, and our back yard is completely shaded by large walnut trees. I had to come up with something more aesthetically pleasing that would be acceptable to both my wife and my neighbors. I settled on planting my rhizomes in an existing vegetable garden that the previous owners

PARTS LIST

1	16 ft. (~5 m) pressure treated 4X4 post
1	4 foot (1.2 m) PVC 4X4 Fence post sleeve
4	2-foot-long (61 cm) ¾ inch Galvanized pipes for the upper arms
4	¾ inch galvanized pipe flanges for attaching the upper arms
4	¾ inch galvanized Ts for the upper arms.
8	6- to-10-inch-long (15-to-25 cm) galvanized pipe, all eight will be attached to the upper Ts to create lateral arms. Since these arms only need to be threaded on one end I have found that it is cheaper to buy a pipe 12 to 20 inches (30 to 51 cm) long and cut it in half. My original ones were 6 inches (15 cm) long but I'm making them a little longer, 9 inches (23 cm) as an upgrade this year.
4	2-foot-long (61 cm) ½ inch galvanized pipes for the lower arms
4	½ inch galvanized pipe flanges for attaching the lower arms.
4	½ inch galvanized Ts for the lower arms, these will be only used as a place to attach bottom of the growing twine.
1	Solar powered fence post cap
1 or 2	Bags of concrete
100 ft	Strong twine or thin rope. Each arm support two growing strings, each about 12.5 (~4 m) tall so 100 feet (~30 m) is just enough to use for one tower.
1	can spray primer for metal
1	can hand hammered copper spray paint
1	can wood stain

You can use different gauge pipe, depending on your local weather conditions 2

3 Here the post is inserted into the fence post sleeve to secure it to the ground.

5 Make your trellis look sharp by painting the pipes with copper paint

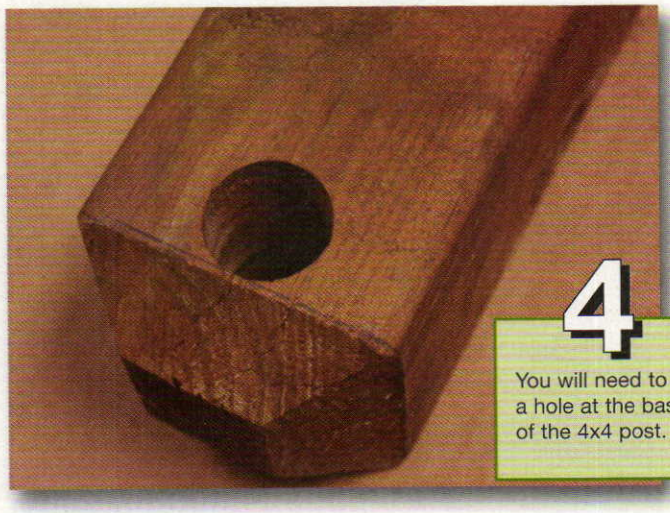
had cleared of rocks and enriched the soil with lots of organic compost, so it made the obvious spot for my hops. The space I was considering was approximately 12 x 24 feet (3.7 x 7.3 m) on the southeast edge of the property and would have full sun almost the whole day.

I wanted to plant a few different varieties of hops so I could have some fun experimenting with them during each fall harvest. I drew up several different designs trying to come up with a way to maximize the number of plants I could grow and still have a nice looking design. Some designs were based on rows, but I could only get a couple rows in my small space. The other thing I realized was with rows, spacing is very important. If the vines are too close together, the first row would shade the other row of plants.

After several designs I settled on a pair of hop towers that would support four plants each. I had seen a few other tower-style hop trellis designs on the Web as I did my research, but most of those designs involved placing a tall pole in the ground and planting the hops all around it. All the plants grow up their strings and converge at the top of the support pole. I was planning on growing different varieties and I didn't want them to all grow together at the top of the tower and make separating them at harvest difficult. I figured that I would solve this problem by using arms at the top of each tower to hold the plants away from the main support pole. I considered building this trellis completely out of wood, but I'm not much of a carpenter. I elected to use galvanized pipe for the arms of the structure (Figure 1).

I used ½-inch pipe and pipe fittings found at a local hardware store. Each of the upper arms is constructed of a pipe flange that attaches the pipes to the wood, a 2-foot (61 cm) section of pipe, a galvanized T and two 6-inch (15.2 cm) pieces of pipe. The lower arm is exactly the same, except that it does not include the additional 6-inch (15.2 cm) sections; it's just an arm with a T at the end.

Hurricane Ike stopped by for a visit this summer and showed me that I should have used ¾" pipe for the top arms instead. One of the upper ½ inch arms broke where the pipe attaches to the flange during the peak of Ike's wrath. Living in northwestern Arkansas I didn't think I needed to hurricane-proof my design, but this year I'm upgrading to ¾ inch pipe (Figure 2). I decided to build the main center support from 16-foot-long (~5 m) pressure treated 4x4 posts.



4 You will need to drill a hole at the base of the 4x4 post.

One of my other big considerations was that I wanted a way to raise and lower the towers for maintenance and harvest. Each spring you will need to run new twine for the bines to grow up, and each fall you will need to harvest the hops that will grow to the very top of your twine. I have never enjoyed being up on ladders, and leaning out to grab

6 For an extra touch, add solar lights to the top of your trellis and they will light up at night.

the last couple of choice hop cones is just asking for a trip to the emergency room.

I found that you can buy something called a "fence post sleeve" which is a PVC square plastic tube that slides right over a 4x4 post. My idea was to sink a couple of these PVC sleeves down in the center of each growing area and secure it with cement, creating a socket in the ground for the post to slide into (Figure 3). I left about 1.5 feet (46 cm) of the sleeve exposed, and then near the top I drilled a hole from one side to the other and notched the other side. I also drilled the same size hole through the base of each 4x4 post (Figure 4). By doing this I was able to create a kind of hinge at the base of each tower. I lay the tower down with its foot lying in the notch on the base and slide a dowel trough the holes on the base and the holes at the base of each tower. It's a simple matter of walking the tower up into its vertical position, removing the dowel and letting it slide into its socket.

To lower the towers you just reverse the process. This can be a bit trickier because you must lift the tower straight up and have someone else insert the dowel, but once the dowel is inserted it is easy to walk it back down to a horizontal position. Being able to lower your hop trellis down to waist level really makes harvest super easy and makes restringing your twine each year a snap.

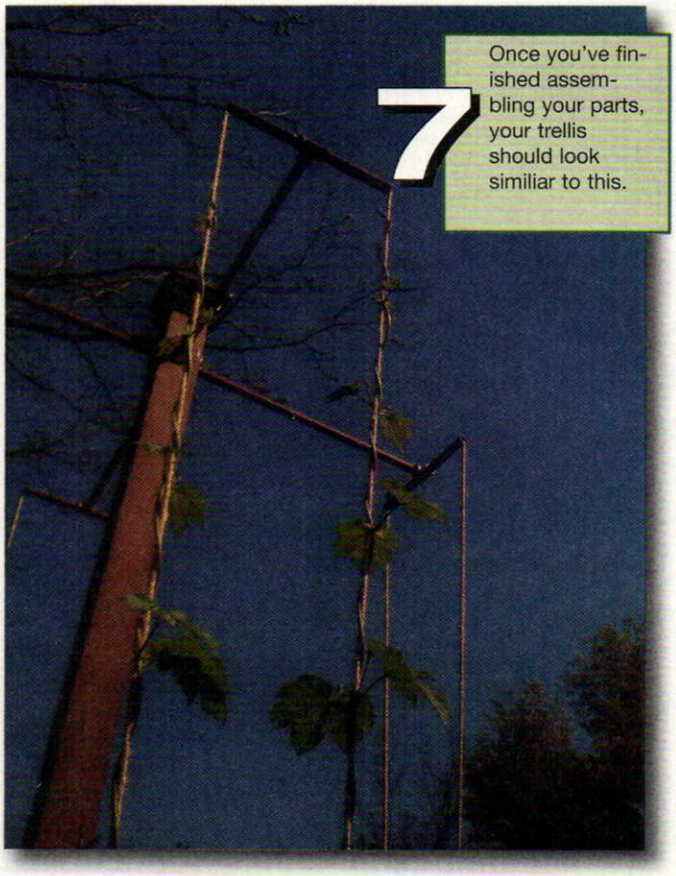
In an effort to make the towers as aesthetically pleasing as possible, I stained the 4x4 posts with a color that matched the color of some of the other wooden structures in the area. For all the galvanized metal parts I found some great paint that leaves the look of hand-hammered copper. I started by thoroughly cleaning each part to remove any grease or grime. Then I primed each one with a primer made for covering bare metal, followed by the copper paint. This really made the galvanized pipes and fittings look nice and added a classy touch (Figure 5).

One of my neighbors had installed solar-powered fence post caps on the stairs leading to his deck, and I thought these would look good at the top of each tower. It would also further tie my design in with the rest of the neighborhood. The lights are copper on top with a little solar panel to keep their batteries charged, and they glow with a gentle white light every night after sunset. My wife jokes that the FAA requires the lights on the towers to keep low flying aircraft from hitting them (Figure 6).

The last piece of the puzzle was the installation of a drip irrigation system to keep the hops from getting thirsty during the long hot summer months. Each plant has a pair of drippers for redundancy, and the whole system is on a timer that keeps my plants watered — even if I forget.

Last March I had the pleasure of being interviewed by James Spencer for his podcast, *Basic Brewing Video*, about the hop trellises that I designed. [March 31, 2008: "Homegrown Hop Trellis" http://basicbrewingvideo.com] We found that my idea for a nice looking hop trellis really struck a chord among some of his viewers. We received several emails from viewers telling us that the unsightliness of a traditional trellis was the single thing that stood between them and convincing their spouse to let them grow hops at their homes. Jerry Marowsky from Oak Creek, Wisconsin was inspired by the design and built three towers very similar to mine. Check out his project on the Web at http://web.mac.com/n0imj/iWeb/Site/Beginnings.html.

Andy Sparks is the owner of The Home Brewery homebrew shop in Fayetteville, Arkansas. This is his first story for Brew Your Own.



7 Once you've finished assembling your parts, your trellis should look similiar to this.

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Last Call

High Rise Rhizome

How I grew an office hopyard

Brett Wilkes • Algonquin, Illinois

Sixteen stories above Chicago's concrete jungle, planted deep in the dirt of office politics, a lone rhizome sets forth a tentative shoot. She will come to be known as Barbara — a prickly Cascade hop plant — and she will forever put those plastic philodendrons to shame.

Brett Wilkes sits with Barbara, his office hop vine. After a few failed attempts to grow hops in his cubicle, he has managed to grow a 10-foot hop vine with views of Chicago's skyline.

I fell in love with the idea of Barbara the first time I laid eyes on my new cube. Is it . . .? Could it be . . .? Yes — sunlight! Following years of typing in dark corners and beneath the evil hum of fluorescent lighting, I finally had a window within arm's reach of my desk. And — beer gods as my witness — I would put those beautiful, life-giving rays to good use.

Fortunately, it was late spring, and my three-year old Cascade vine at home in the 'burbs was going rhizome crazy. I got up a little early for work one morning, cut myself a fine 3-inch specimen and gently wrapped the little guy (er . . . gal) in damp newspaper. Then I rummaged around our squirrel-infested garage until I came across a knotted ball of twine and an empty 12-inch pot (only slightly cracked). Crazy as I was, the thought of lugging dirt across town on my 30-minute walk from the train station seemed a bit much. So I opted to pick up some fresh potting soil on my lunch break instead.

Easier said than done. I had to hike to three different "convenience" stores and one grocery store before I struck pay dirt . . . or any dirt for that matter. Am I the only one downtown trying to grow brewing herbs in a high-rise? What's with these city folks? The small bag of soil I found contained "Moisture Plus Crystals." Sounds good, right? I mean, what plant wouldn't like a little extra moisture? I'll give you one clue: hops.

For the first couple of weeks, Barbara did great. With daily waterings, the most vigorous of her three shoots climbed about two feet up my makeshift trellis (hung from the window frame by paperclips). But then it just kind of . . . stopped. It shriveled up and died along with a second emerging shoot; I'm pretty sure their roots rotted. Without additional water, the remaining shoot actually grew a total of four feet in the opposite direction of the sun before it mysteriously became decapitated overnight. I never learned who (or what) did it, but I have my suspicions.

Undeterred, I planted a second rhizome beside the first, and this time I took it easy on the showers. Maybe a little too easy. Again, stellar growth at first, but eventually the vines became brittle and dropped leaves. All but one. The very last shoot that Barbara produced benefitted from its trail-blazing siblings. With a steady watering every three to four days it successfully grew the length of its trellis line, about eight feet, and continued to sprawl for another four. Success.

Now, the only question was, would she produce cones? My mouth was watering at the thought of making a Dilbert Dunkel, or maybe an Administrator Doppelbock. I checked each morning for a sign, but alas, it was not to be. As the summer days grew hotter, my building began to shut off the air conditioning after five. The drying effect this had on Barbara's soil at night, combined with what was surely a crowded root system in such a small pot, soon made it impossible for me to give her enough water. She died over a long weekend, alone and coneless.

But do not cry for Barbara. For she lives on. A solid month after I cut down her crispy remains and hid her pot under my desk for the dormant season, a new shoot broke ground. Year-round hops?? At the time of this writing, there are still no cones, but Barbara is ten feet high if she's a foot. And she's still growing, healthier than ever.

Brett Wilkes is an advertising copywriter and proud member of The Midnight Carboys. Check them out at www.midnightcarboys.com.

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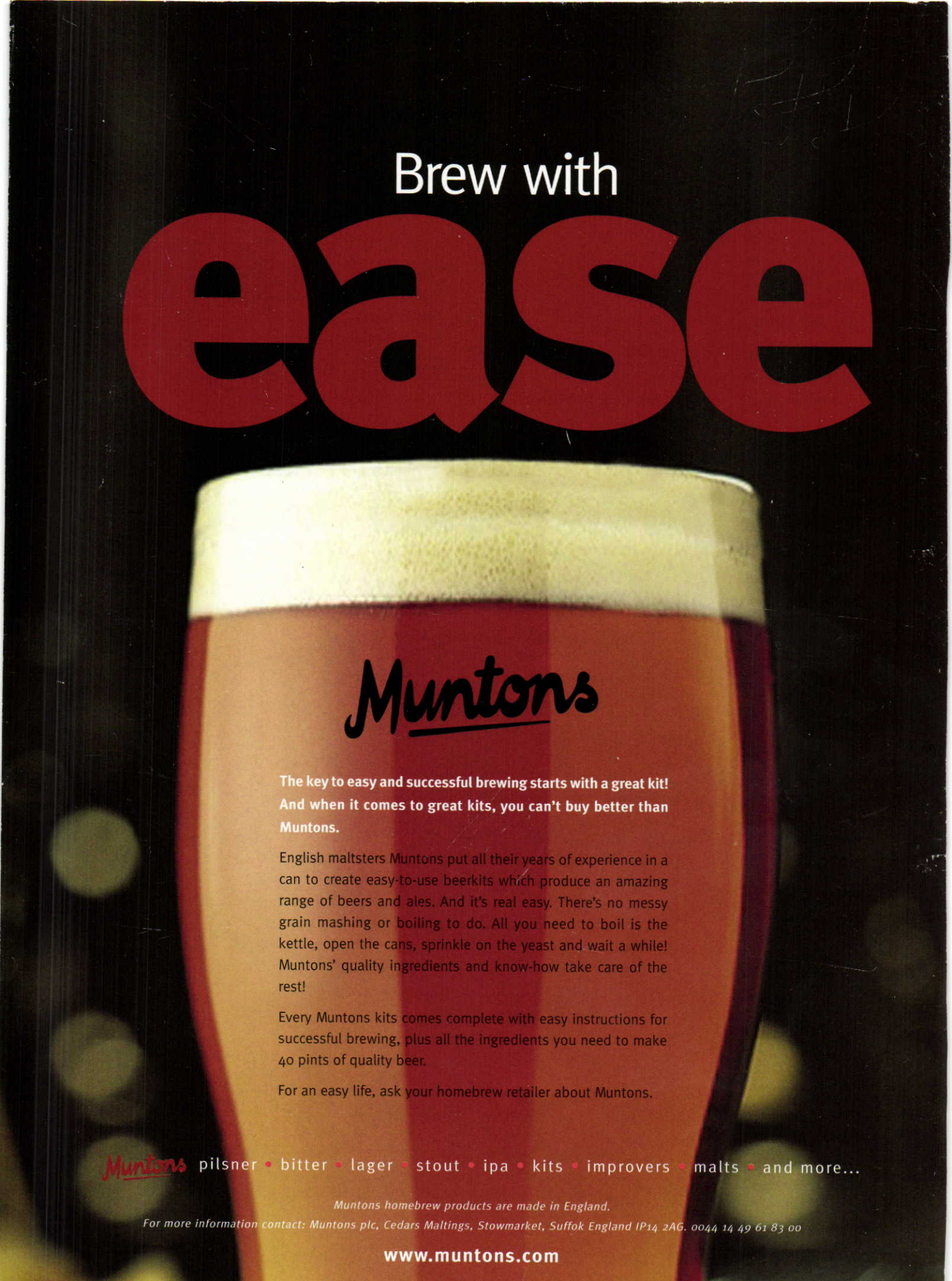
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