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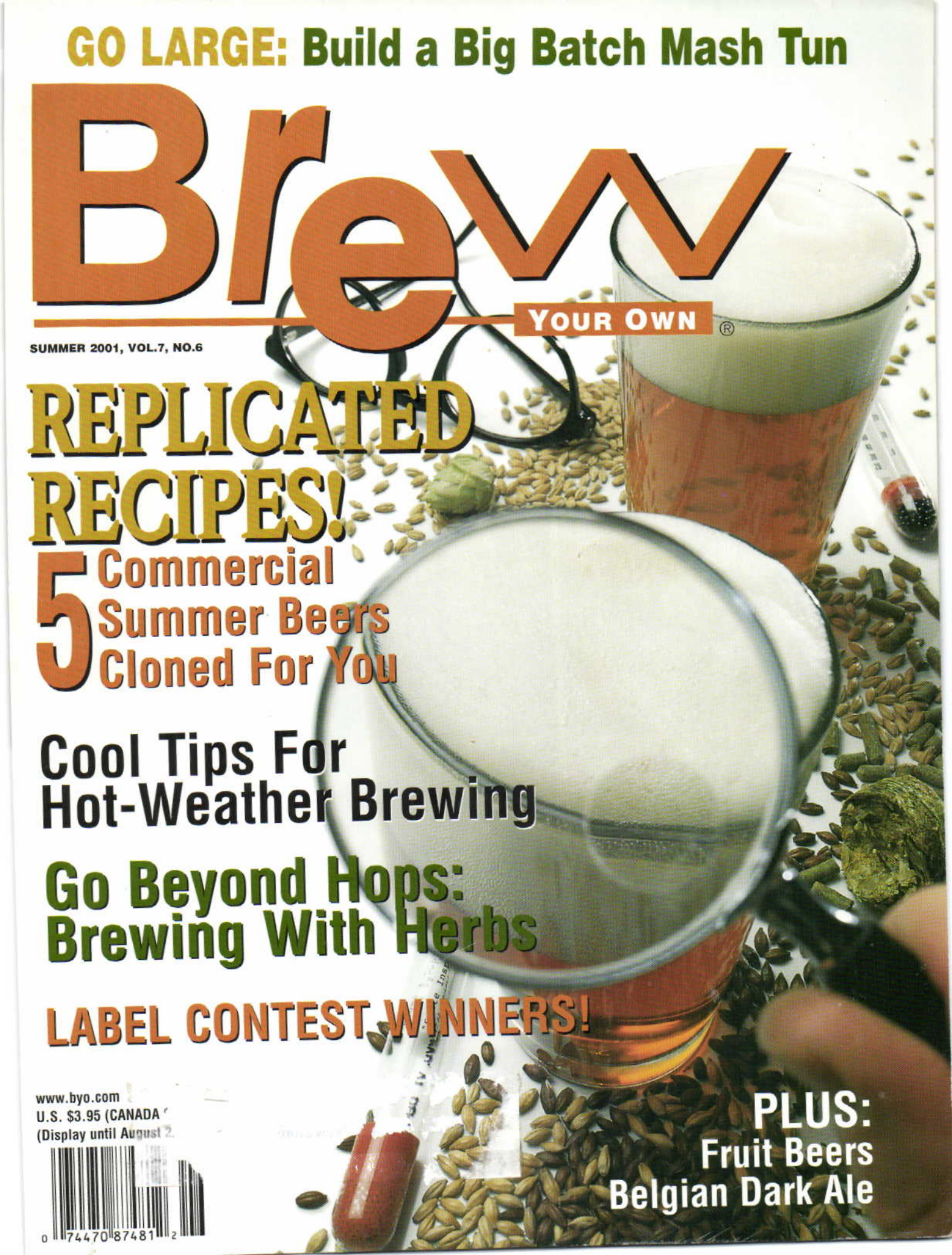

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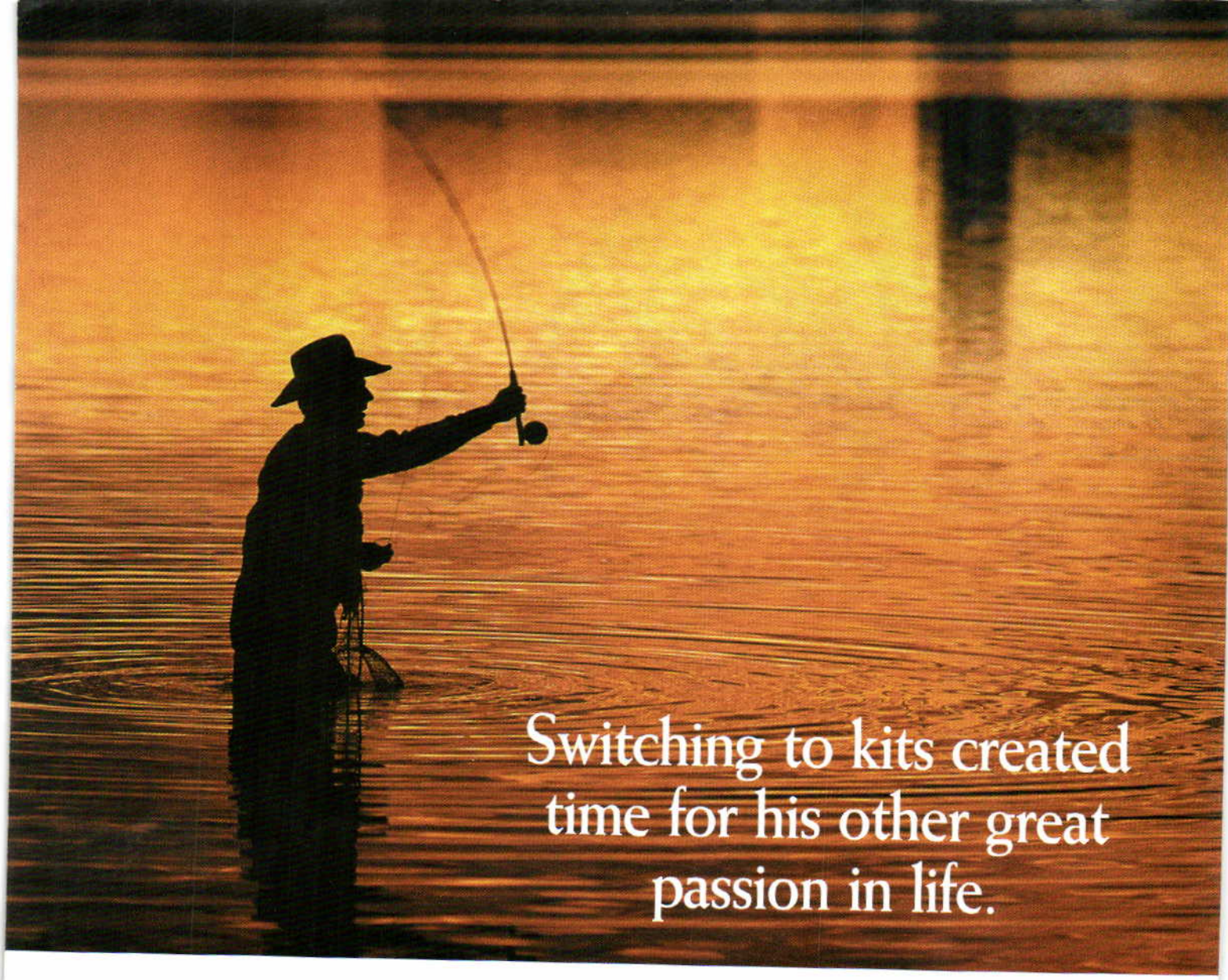

Switching to kits created time for his other great passion in life.

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'Weekend Telegraph' (April 99)

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Summertime Brews

There ain't no cure for the summertime blues? Baloney. The guy who wrote that old rock-and-roll tune needs to take a good look at this issue of *Brew Your Own*, because a cure most definitely has been identified: homebrewing, no matter how hot the weather, and then kicking back on the porch with a tasty summer beer.

"For centuries, brewing was a seasonal activity," writes frequent *BYO* contributor Chris Colby. "Beer was brewed in the colder months and stored in caves. But the fermenters were empty throughout the summer because brewers could not control their fermentation temperatures. For many homebrewers, brewing is still a seasonal activity, for the same reason." No longer: Chris, who lives in red-hot Texas, offers a plethora of practical tips for summertime brew sessions in "Make Me Sweat," which starts on page 42. Besides detailing the "wet T-shirt method," which is not quite as racy as it sounds, the article also offers a sure-fire hot-weather recipe and recommended yeast strains.

This warm-weather issue also serves up enough seasonal tips and recipes to keep you brewing until fall. In "Recipes Revealed" *(page 28)*, the Replicator presents clone recipes for five great summer beers, from Magic Hat #9 (an apricot pale ale) to Tire Biter Ale (a crisp kölsch). And we offer insights into brewing fruit beers — like lip-smacking raspberry or apple ale — in "Tips from the Pros" *(page 9)*.

While you spend the summer brewing, we'll take advantage of our brief break (we don't publish *BYO* in July or August) to plan new departments and a terrific line-up of feature articles for fall. See you in September!

Kathleen

Contributors

Matt Cole is a key member of the *BYO* editorial-review board. Head brewer at the Rocky River Brewing Company in his home state of Ohio, Matt has been an avid all-grain homebrewer for more than a decade.

While earning his undergraduate degree in criminal justice, Matt also completed the short course at the Siebel Institute. After graduation, Matt traveled around Europe, seeking out classic beer styles, meeting brewers and completing the University of Sunderland's "British Brewing Technology" course in Newcastle, U.K. Once back in the States, he worked at the Baltimore Brewing Company and The Great Lakes Brewing Company in Ohio before arriving at Rocky River, which is near Cleveland.

Matt works a one-man operation at Rocky River, producing award-winning beer on a 7-barrel system he helped design. His beers have won awards at The Great American Beer Festival, The World Beer Cup and The Real Ale Festival. He still homebrews once a month and likes making big beers. Here's to Matt!

Brew Your Own
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How To Reach

Brew Your Own

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MaiL

Old Style

I grew up on the North Side of Chicago, so I was happy to see Wrigley Field featured in "Baseball Beers" *(April 2001)*. I was also filled with anticipation as I searched for the beer that you were featuring. Now, I have nothing against Goose Island. They make some very good beers. In fact, my first experience in homebrewing was taking a class at the brewery ten years ago. But I have never known anybody to order a Honkers Ale at a Cubs game.

To properly enjoy an afternoon in the bleachers, you need something with tradition and style. Something fully kraeusened in the Old World tradition. Show me the recipe for some Old Style. Now that's a fine lager. And that is a baseball beer.

Kevin Gallagher
via e-mail

The Bitter Truth

Thanks for printing our Smithwick's Ale clone recipe in the April 2001 "Reader Recipe" column. We just have one question: Why was the hops bill modified to be only 0.66 ounces of East Kent Goldings instead of the original 1.5 ounces? It really doesn't appear to be an improvement and it's a significant reduction in bittering.

Randy and Amy Germann
San Antonio, Texas

Technical editor Ashton Lewis responds most sheepishly: "Unfortunately, I made a big mistake and assumed that all of the Goldings hops were added at the beginning of the boil (even though the step-by-step indicates otherwise). I felt that 1.5 ounces would be too bitter for what the Germanns reported the target bitterness to be. Their original recipe was fine (0.5, 0.5 and 0.5 added during three times during the boil)."

Beano No Joke

I just read your "Beano Brew" article *(March 2001)*. At first I thought it was an April Fool's joke but, upon further reading, it started to make sense. I have had a problem with using adjuncts and ending up with higher-than-anticipated final gravities. If Beano really works to drive down the final gravity, it is the answer to my prayers. How many tablets do I use per pound of adjunct? In your recipe, you said to use 1.25 pounds of flaked rice and three Beano tablets. What if I use more flaked rice? Should I use more tablets? Will it affect the taste of my beer?

Chris Storey
via e-mail

Beano author Ashton Lewis says: "Beano does work to reduce the final gravity by converting carbohydrates to fermentables. I would suggest using three tablets for 1 to 3 pounds of adjunct as a starting point. If you choose to use more adjunct, then use another tablet or two. Remember that there is a limit to the amount of adjunct you can use. I would not recommend going over 40% because you will begin to run into other problems unrelated to Beano or light-beer brewing."

Top it Up

I just brewed an IPA (Bell's Two Hearted Ale) according to the Replicator recipe on page 16 of the February 2001 issue. I have one important question regarding water: The recipe calls for 3 gallons in the boil, and that's it. When I brewed the recipe, I put a couple of cold gallons in the primary before I poured the cooled wort into it. The final volume came out to about 5

gallons. Was this wrong? The recipe in your magazine didn't call for the extra water, but I don't see how I could have gotten 5 gallons of beer otherwise.

Joe Weimann
Oakdale, Minnesota

The Replicator responds: "You were absolutely right to add water in the recipe you mention. I simply forgot to explain that you should top up the fermenting vessel to five gallons. Sorry!"

Well Done

Thank you for producing a great magazine. I have been brewing for the better part of 17 years now. I am an avid reader of your magazine and find it to be extremely informative. I am now getting ready to go into commercial production but will still be enjoying homebrewing.

I hope that every homebrewer will read the magazine from cover to cover and get as much out of it as I do. I would just like to commend you on a job well done.

Chris Sousa
Head Brewmaster
Derby Brewery

Mini-Batch

I have been homebrewing, both extract and all-grain, for several years. When I first started the hobby, I tried brewing every possible style of beer for which I could find a recipe. More recently, I have developed three or four favorite recipes that I brew consistently. I miss some of the unusual brews from my novice days, but don't necessarily wish to have the two whole cases that a regular five-gallon batch would make.

I'm wondering whether the standard five-gallon recipe can be reduced. Can ingredient amounts be reduced proportionately? If not, then what sort of adjustments must I make to the recipe?

Mark Kohler
Meriden, Connecticut

When scaling down a standard five-gallon recipe, all ingredients can be reduced proportionately, including the yeast.

Back Issue

Having grown up around the world, then enjoying a rewarding career in the Navy, I have been around the globe and halfway back five times. I know good beer and I enjoy good beer. Now that I am "landlocked" and don't wish to pay high prices for foreign beer, I find that brewing clone recipes is the only way to go.

Recently I helped a buddy get started brewing and, being a good friend, I often lend him my copies of *BYO*. He has since lost one of the latest issues, and — as Murphy's

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Law would have it — it was the one that I really need! It has several articles that pertain to my upcoming projects. I need a copy of the great "Germany in a Glass" issue *(February 2001)*.

If you would be so kind as to send me a replacement issue, I would be most grateful. I may even sign my friend up for a subscription! Once again, thank you for your help and may I say that you have a loyal reader here.

Roger M. Rodman
via e-mail

No worries, Roger! Your Germany issue is on the way.

Fresh Hops?

Your article about growing hops in the April 2001 issue was very interesting. However, at the end it states you should never brew with undried hops; they contribute a grassy, unpleasant flavor. But in the September 2000 issue, Mr. Wizard says unkilned hops from a backyard garden are great and should be used immediately after picking. Could you please clarify?

Phil Davis
via e-mail

Using fresh hops is a matter of personal preference. Though the authors of the hops story, Joe and Dennis Fisher, don't brew with fresh hops, many other brewers do. This technique is gaining popularity in the brewing world. Sierra Nevada, for example, has brewed a Harvest Ale with unkilned hops for the past five years.

Nutritional Value

I've been brewing for about a year now, and recently a question came to mind. I've noticed that commercial beer bottles and cans give an analysis of the beer, including calories, protein and fat content. I wanted to know if there's any way to calculate these numbers for homebrew.

Eugene Grasso
via e-mail

The only beers required to carry a nutritional label are light beers. The nutritional information on beer labels comes from chemical analyses that are designed to assess the amount of protein, carbohydrate and alcohol. There are other ways of estimating the amount of protein, carbohydrates and alcohol in beer, but the estimates are not reliable. The factors with the most influence on these numbers are OG, FG and the amount of adjunct used. Over 50 percent of the beers in the world have an OG around 1.046 and an FG around 1.010. Beers in this range all have about the same amount of alcohol and carbohydrates. Adjunct use influences protein content, but beer is quite low in protein and rarely contains fat. ■

Lookout Mountain

A hang-gliding homebrewer builds himself a mini-brewery

Christian Thoreson
Rising Fawn, Georgia

PHOTO BY CHRISTIAN THORESON

The Lookout Mountain Brewery, which measures 12 by 20 feet, is home to an all-grain brewing system, a beer fridge and, of course, a porch for watching sunsets.

After spending six years in the Bavarian region of Germany, I returned to America in 1985 and embarked on a quest to find beer as good as I'd had over there. I had little luck. So when I married in 1992, I got a plastic bucket and a can of extract for a wedding gift. We made several batches of homebrew and enjoyed the flavor, but I wasn't entirely satisfied. I bought books, searched the Internet and perused magazine articles in search of better beer. I graduated to partial grains and the flavor improved noticeably. I was getting closer. I soon realized it was time to learn the language of mash tuns, sparging and false bottoms.

For my 40th birthday, my wife presented me with my very own 170,000-BTU burner and a mash tun. It didn't take long before I had two more burners and two more stainless-steel pots, a wort chiller, a pump ... and the list goes on. Since I had too much equipment to fit in the kitchen, I ended up brewing out on the back porch — even in the middle of winter with ice coating everything (yes, we have ice in Georgia).

After a year of brewing out on the porch, my wife and I decided it was time for me to get a space of my own (with enough room for her to store her wine).

Thus the "Lookout Mountain Brewery" (12 by 20 feet) was born. My equipment inventory keeps growing but my wife's wine still hasn't found a home. I have an old refrigerator with a tap, a stand to hold the tuns and burners, a deep commercial sink and counter, a CD player and multiple shelves for storage. The total cost of my brewery was about $8,000, including the deck for watching sunsets.

Every brewery needs a logo. I live in a hang-gliding community, where I am the flight school director for the largest hang-gliding school in the country. It only made sense that the name referred to our favorite sport. An artist, Tammy Piper, designed our logo as a thank-you for flying lessons. It depicts Otto Lillienthal, the first hang-glider pilot (circa 1890), launching one of his wings *(see page 40)*.

My dream is to someday open a commercial microbrewery, but in the meantime, this will continue to be a place for my friends and I to brew beer, play darts and tell each other lies about how much altitude we got in today's thermal.

The master of his domain: Christian still can't find room for his wife's wine.

Three gas burners, stainless-steel pots, a stand and a bottle drying rack.

Cool Pool

Dennis Myers
Yorba Linda, California

Dennis' homebrewed lager takes a dip in California cool (50° F) pool water.

I have been an avid homebrewer for about six years. I started out brewing simple ales, then lagers (fermented at warmer temperatures). I eventually switched to proper cold-fermented lagers. I have a spare refrigerator in my garage that is perfect for fermenting lagers and storing my beers. With the current energy crunch, I'm probably not doing my fair share for energy conservation, but my philosophy is: If I run out of electricity, I'll have enough beer to get me through the blackouts.

My problem with lagers is that they are always out of synchronization with each other. One lager will be fermenting at 50° F while the other carboy needs to cold-condition at a much lower temperature. I have recently solved this dilemma.

The solution to alleviating our energy crisis and brewing more than one lager at a time was right in my backyard. I have a swimming pool and the water temperatures remain a constant 50° to 52° F from December through March. I put my freshly brewed lager into the primary fermenter and placed it, partially submerged, on the steps of the pool. I placed it on stacked pavers to ensure that it was not too deep and wouldn't float away or tip over and spill in the pool. I also had to ensure that the wort would not be exposed to light as a result of being stored outside. I wrapped the fermenter with black plastic bags and placed a dark towel over it.

It fermented perfectly during the primary. After about 10 days, I transferred it to a five-gallon glass carboy. Then back in the pool it went — despite my strict "no glass by the pool" policy. After a few weeks in the secondary, I moved it to the spare refrigerator that maintains a temperature setpoint of 35° F. It's now conditioning.

Overall, it seems my idea was a success. I am awaiting the bottling process and I'll let you know how it turns out in a few months. Now I just have to think of an appropriate name for this beer. You can bet that once we sit around the pool to drink it, we'll come up with something. ■

Juicy Fruit

How to brew refreshing summer fruit beers

by Thomas J. Miller

With summer comes stifling heat, the kind of heat that makes tar bubble on the sidewalk and leather car seats singe your bare arms and legs. If you have air-conditioning, you could stay inside and enjoy the cool. Or you could relax outside and keep yourself refreshed with some crisp, delicious fruit beers.

Though some brewers dismiss them, fruit beers can be a wonderful addition to your brewing repertoire. When done properly, fruit beers can taste great and impress your friends.

Fruit beers can incorporate any kind of fruit, though some fruits are more popular than others. Raspberry, cherry and peach are three favorites that come to mind. Blackberry and orange are two other fruits that often are merged with beer.

This month's lineup of pros offer great ideas on how to formulate a base recipe that works best with fruit beers. Our pros also give you practical advice on when to add the fruit and what characteristics you should look for in your finished beer.

Brewer: Bill Bryson of Willoughby Brewing Company in Willoughby, Ohio. Bryson graduated from Ohio Wesleyan with degrees in biology and philosophy. He has been brewing since 1998 and has been the head brewer at Willoughby since January 2001.

We use real fruit in a purée form to brew our Railway Razz, which won silver in 1999 and bronze in 2000 at the Great American Beer Festival. We let the beer ferment out and then add the purée to the fermenter, creating a secondary fermentation and instilling the raspberry character. Instead of the usual golden beer base, we decided we would be better off backing up the fruit with a stronger base. We wanted a little more depth to the beer, so that it wasn't just a thin beer with raspberry flavor in it. The predominance of these light-based fruit beers is why the style is losing popularity.

We use a recipe that is 87 percent pale malt, 6.5 percent roasted wheat and 6.5 percent DeWolf-Cosyns Special B, which is like a Belgian caramel that lends color and flavor and creates a nice caramel, chocolatey background.

We do a simple infusion mash at 152° F until starch conversion is complete. Then we recirculate the wort for one hour to get perfect clarity. Homebrewers could recirculate for 30 minutes or so and still get good results.

We boil for 90 minutes and add Columbus hops, since it's a high alpha-acid hop. The goal is to offset the sweetness of the malt and the fruit so that there's a balance. We look for about 12 bittering units (IBUs), adding the hops at 90 minutes and 60 minutes. We don't add any aroma or flavor hops at the end of the boil.

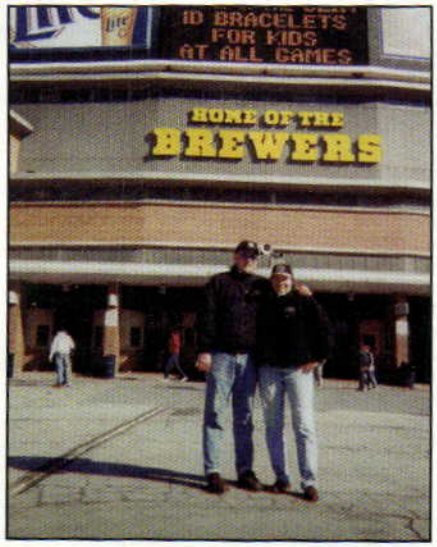
We ferment at 65° F, and the original gravity is 1.044. We use an English ale yeast with good attenuation. I once tried a hefeweizen yeast that made a pretty good brew.

When it ferments down to 1.016, we lower the temperature to 50° F, which drops the yeast down into the cone section of the fermenter. We get as much yeast out as possible so the attenuation won't go crazy and ferment the sugars down so far that the beer gets an unpleasantly tart, wine-like flavor.

At this stage, we add a mixture of Oregon Fruit Products raspberry purees. We use 75 percent red raspberries and 25 percent black raspberries. For homebrewers, there are 3.3-pound cans of purée that work well in five-gallon batches.

I've also used freshly puréed frozen raspberries. These worked fine and I never had problems with infections or anything. The frozen fruit has some liquid in it, so it purees nicely and pours into the fermenter without a problem.

I think the key to fruit beer is to have a beer that is fruit fermented, rather than just fruit flavored. You'll know you've succeeded if the two flavors seem to just mesh together.



Brewer: Denise Jones of Third Street Aleworks in Santa Rosa, California. Denise graduated from the American Brewer's Guild in 1995. She started as an assistant at Great Basin Brewing in Sparks, Nevada. She has worked at Third Street Aleworks for three years.

I have brewed many types of fruit beers over the years. The most essential part of brewing fruit beer is a good base beer. The base beer can't be lackluster, in hopes that the fruit will make it better. This means the entire brew should be carefully planned before you even start. If you're using a sweet fruit, balance it with a slightly drier beer. If you're doing a sweeter base beer, then choose a tart fruit. You need to get the flavors in your mind and decide how they're going to marry in the finished product.

I don't hop my fruit beers that much. When I brew with fresh fruit, I try to make sure that the fruit is the focus and I don't want bitterness to invade the flavor profile. The goal is to have subdued hop characteristics that are just enough for balance. I suggest you formulate your base recipe using the amount of hops you would need to achieve balance in that traditional style.

Every beer is different. The time to add the fruit will vary widely. I know brewers who put the fruit in during the mash, in the boil, in the whirlpool or even in the hopback. They also add fruit during pre-fermentation (in the mash or even in the boil), post-fermentation (when it's winding down and the SG has bottomed out), or add the juice to the serving tank and put the beer right on top of it.

The best choice is going to depend on what technique works best for you, plus what fruit you're dealing with. I don't think any one method is best. Homebrewers should experiment with two or three methods until they find what's best for them. But if you put fruit in the fermenter, you're going to get fructose notes that will add a wine-like quality to your beer. This is because the sugars will be fermented down, just as if they were being fermented to make a wine.

Brewer: Kevin Gray of Niagara Falls Brewing Company in Niagara Falls, Ontario. Kevin started working at the brewery in 1991 and became the head brewer in 1998.

Everything that we did with our fruit beers was experimental. It took a lot of time and patience to get our recipes right. Homebrewers should expect this same learning process if they want to get really good at making fruit beers.

We make our Niagara apple ale out of a concentrate that contains no preservatives. We originally got the concentrate from South Africa, but now it comes from China. Our only stipulation when buying the concentrate is that it's free of preservatives. We work hard to make good beer with four main ingredients, and we don't want to counteract that with a product that isn't natural. All concentrates are a blend of three to five different varieties of apples. Single variety concentrates are impossible to find.

It won't be easy, but homebrewers should be able to find preservative-free concentrate. We buy it in bulk, so it's easier for us to get it. It's basically the same as cans of frozen juice, except this concentrate isn't frozen. It is a refrigerated, thick syrup of about 75 percent sugar. The amounts of frozen juice needed for a five-gallon batch will vary. The homebrewer needs to test sugar content and then do some experimenting.

In a commercial brewery, dealing with whole fruit would be a mess. For homebrewers who deal with smaller quantities of materials, it would be much easier to blanch some apples and purée them. They might also use 100 percent apple juice concentrate purchased from a grocery store.

How much juice you add is a question of taste and how much apple flavor you desire. The best time to add the juice is near the end of fermentation. Fruit sugars are 100 percent fermentable, unlike some grain sugars. If all the sugar ferments away, you'll lose the apple flavor. If you only want more alcohol in your beer — and you would get this if you put the apple juice in at the start of fermentation and let it ferment out — the more economical decision is to use some kind of cheap sugar source. Apple juice gives the best flavor when added just as fermentation is nearly complete. The beer must be crashed, by bringing the temperature to 32° to 34° F, immediately after adding the concentrate. Otherwise the addition of another sugar source could possibly re-initiate fermentation.

Apple is a subtle fruit. I recommend a light golden ale as your base for an apple beer because you would be contradicting yourself if you brewed a stout and added apple juice. You would only taste the stout but not the apple!

Really, there is no single right answer when it comes to brewing fruit beers. I think that experimentation is the best way. Just have fun and you'll soon learn to create excellent homebrewed fruit beers. ■

"Help Me, Mr. Wizard"

Why the Lag?

Secondary fermentation, multi-step mashing and monkey brew

Mr. Wizard

I have been brewing ales for three years. For my most recent two batches, I decided to go with lager yeast. When brewing the first batch, I pitched the yeast at 70° F and put an airlock on. For the second batch, I pitched the yeast at 50° F and put an airlock on. For both batches, it took five days for the yeast to start fermenting. The first batch turned out fine, and the other is fermenting. Could the slow start be caused by putting an airlock on too early and the yeast not getting enough oxygen? Do you have any suggestions?

Douglas Evans
Arvada, Colorado

The main factors that influence the "lag" time between pitching yeast and the onset of vigorous fermentation are pitching rate, wort aeration and wort temperature. When seasoned ale brewers, like yourself, brew lagers they often make the mistake of simply switching yeast strains and fermentation temperature.

In my experience, lagers ferment much better when a higher pitching rate is used. For example, many commercial ale brewers use between 5 and 10 million yeast cells per milliliter of wort while lager brewers typically use between 15 and 20 million yeast cells per milliliter of wort. Homebrewers do not usually count yeast cells like commercial brewers, but, given the same type of yeast slurry thickness, you would need to double or triple your pitching volume to get these results. My comments on pitching rate in the past have generated some debate, but it is my experience that many brewers add insufficient amounts of yeast. Your description of the slow start sounds like a classic case of under-pitching.

Wort aeration also has a dramatic influence on the length of the lag time because oxygen is used by yeast for growth. Low wort-oxygen levels translate to decreased yeast growth, lower peak-cell density in solution and longer fermentation times. The best methods for aeration utilize some device to actively transfer oxygen into wort, such as an aeration stone. Simply splashing the wort as it enters the carboy is not as effective as an aeration stone, and relying on oxygen from the atmosphere to diffuse into the wort by briefly leaving the airlock off is the least effective method. If you are using the latter technique, your slow starts could certainly be due to poor aeration. I would advise using a different method, then putting the airlock on immediately to minimize the risk of contaminating your wort with airborne microorganisms.

Finally, there is the temperature variable. Some lager brewers like to add plenty of yeast, begin fermentation between 46° and 48° F and allow the fermentation to rise to about 52° F. These brewers feel this method produces the cleanest lager flavor. Other brewers advocate beginning fermentation around 70° F and cooling it down to around 52° F after fermentation begins. This method is used to compensate for lower cell densities by stimulating yeast growth. I have experimented with various methods and have found that some lager strains are more finicky than others and really don't work well with cool starts. The lager strain I most frequently use is a German pilsner strain. It works best for me if I use a healthy pitching rate and begin fermentation no cooler than 52° F. I typically see active signs of fermentation within a day of pitching, and primary fermentation is usually complete within 14 days.

Mr. Wizard

Is secondary fermentation necessary or even desirable for all styles of beer? My local homebrew supply shop (and microbrewery) advised that, unless I plan on dry-hopping, I should not use a secondary fermentation. Their main objection was the unnecessary risk of contamination. Are there other benefits, besides dry-hopping and clarification, in using a secondary fermentation? If I were brewing a stout, would I be okay using a two-week primary fermentation — and maybe dropping the temperature a bit, after 5 to 7 days, for the remaining 2 weeks — before bottling or kegging?

James Albrecht
Naperville, Illinois

I like this question because it contrasts the conventional wisdom

Mr. Wizard

of homebrewers, who almost always refer to primary and secondary fermentation, with commercial brewers, who ferment in "uni-tank" fermenters. To be honest, I have never understood why the homebrewing vernacular uses the term "secondary fermentation" to describe the aging process. Typically, when wort is fermented in the "primary fermenter" it ferments completely. The specific gravity ceases to change after a week or two, and then it is transferred to the "secondary fermenter" for aging. If the beer is transferred to the secondary after fermentation is complete there will be no "secondary fermentation." The true second fermentation occurs when priming sugar is added to the beer at the bottling stage and the result of this second fermentation is carbonated beer.

Historically, most commercial brewers would use a primary fermentation vessel (open or closed) to completely ferment their beers and then would transfer the young, flat beer to a conditioning vessel for aging. Lager brewers typically would add kraeusen (young fermenting wort) at this stage and ale brewers would add priming sugars. The beer would clarify, carbonate and age during this secondary fermentation. Then the beer would be filtered (if the style called for filtering) and bottled or kegged.

These days, uni-tank fermenters have gained popularity and the process has been simplified. Fermentation and aging are conducted in the same vessel. Many brewers "cap," "bung" or "spund" the fermenter when the specific gravity is about 1° Plato above the expected final gravity. This technique allows for natural carbonation and the devices used can be adjusted to vent excess pressure from the fermenter, allowing control of the carbonation level and protection against over-pressurizing the tank. Most uni-tank users hold the beer at fermentation temperature for a few days after fermentation is complete for diacetyl reduction and then cool

the beer either slowly or rapidly depending on the particular brewery. After the beer has been aged it can be filtered, if desired, and packaged. A typical timeline for a uni-tank ale would be a 5-day fermentation capped after about 3 days, followed by a 2-day diacetyl rest, then by a week at near-freezing temperatures. Uni-tank lagers may ferment for about 10 days before capping and usually are lagered for about one month before filtration and packaging.

The great thing about uni-tanks is that they have conical bottoms, allowing the yeast to be removed shortly after cooling for re-use. Some brewers periodically purge the cone of yeast sediment during aging to reduce off-flavors associated with yeast autolysis. Most microbrewed beers you drink are probably made using a similar method to what I have described and most likely have been exposed to yeast sediment during aging. Beers that are dry-hopped are either transferred to another tank with the hops placed in the tank prior to transfer (or the hops are added to the uni-tank from the top after fermentation is complete).

I have made many five-gallon batches of beer in a single carboy with great success. I have also fermented a lot of beer in uni-tank fermenters with equal success. I agree with your local homebrew shop that a secondary fermenter is not required to make great beer. Furthermore, it is possible to produce very clear beer in a single-vessel process if you cool the beer prior to racking it — provided that you are careful and skillful.

Give it a try and see how it works for you! If you like the beer produced by this method, you have one less fermenter to clean and sanitize per batch and you only have to rack the beer once.

Mr. Wizard

I am brewing all-grain beers at a brew-on-premise and I have switched from their recommended one-step mash at 150° to 152° F for one hour to a multi-step mash. I am starting at 130° F for 30 minutes, going to 140° F for 20 minutes and finishing at 148° F for 40 minutes. My brews are less malty tasting and better reflect the styles I am trying to duplicate. Of course, the BOP folks don't like me to take this much time. They say that I'm just wasting time and energy doing these multi-step mashes. What are your thoughts on multi-step mashing? Am I wasting time?

Bob White
Essex Junction, Vermont

You seem to have answered this question for yourself. Based on your experience you are brewing beers that are less malty — I interpret this as drier — and are more true to

the styles you are brewing. The mash profile you describe will certainly produce a more fermentable wort than infusion mashing at 150° to 152° F and will most likely result in a drier finish in the beer. If that description agrees with your goals then you are not wasting your time.

Dry beers (like Asahi Super Dry) and light beers can be made by extending the rest at 140° F and extending the time it takes to heat from 140° F to the conversion temperature (usually about 158° F). Other lager styles, such as pils and helles, also benefit from a similar profile. Not only does the rest at 140° F increase the perception of dryness, but it also results in beer with more alcohol because the wort is more fermentable. The long and short of it is that you are right and the BOP folks are wrong.

Homebrewing is a hobby and it's only logical that homebrewers would want to experiment with different methods. If your method is a "waste of time" then so is the whole hobby! Your method takes about 105 minutes, including the heating steps, compared to 60 minutes for the infusion method. I am sure that 45 minutes really seems like an eternity in relation to the 20,160 minutes it takes most BOP beers to be ready for consumption.

The hobby of homebrewing is not about saving time. It's about making good beer, and that takes time! If this BOP is so busy that your extended mash profile reduces the profitability of their equipment, then they have a legitimate concern. You could offer to pay them an hourly rental on the equipment so both parties are happy. If the added expense is not worth it, then perhaps the difference in your beer is not that important. I am still on your side, however. Big brewers, including the biggest bad-ass on the block, use long, multi-temperature mashes because it does make a difference. You can bet your bottom dollar that these profit-minded corporations would use a single-temperature infusion mash if they could.

Mr. Wizard

I am curious if it's feasible to brew hard lemonade. My wife is not much of a beer drinker (except when I force her to sample my latest batch), but she enjoys Mike's Hard Lemonade. I am under the impression that this is a malt-based beverage with lemon juice added for flavor. Am I correct in this assumption? Are there any recipes? If not, I may try to experiment with formulating small batches on my own. I am concerned with the high amount of citric acid in the lemons. Will they make my "wort" too acidic? If so, what would you recommend I add to compensate for this?

Mike Lee
Susanville, California

These new products are not much different than malt-based coolers and other "alco-pops." All of these beverages begin in a similar way. Usually they are made with a fairly high percentage of non-malt adjuncts to reduce wort flavor and color and do not include hops. This light-colored wort is fermented, treated to remove color (usually by charcoal filtration) and then turned into the alco-pop flavor *du jour*. Fruit juice blend is added to the base beverage for flavor and color and high-fructose corn syrup for sweetness. After bottling, the beverage is then pasteurized, since filtered beer invariably contains yeast and the yeast will ferment the added sugar.

None of these products, as far as I know, add any of the fruit or fruit flavoring during mashing. If you did add a large dose of lemon juice during mashing, you would significantly reduce your mash pH. Although lemon juice is very acidic, it does contain a lot of sugar and the sugar is a big part of the overall lemon flavor, as with other fruit juices. When the fruit flavor is added after fermentation there is much better retention.

Making something like Mike's Hard Lemonade at home would be very difficult. An alternative would be to brew very light beer and blend the beer with some sort of fruit cocktail at the time of serving. The Germans drink a blend of helles lager and lemonade that's called a "radler" (which means bicyclist). The key to a radler is the lemonade; German "lemonade" is more like 7-Up, a carbonated, sweetened lemon soda. The British version of this concoction is the "shandy." Most beer purists snub their noses at this because it hides the flavor of the beer. I suppose that is the idea, but the result is highly drinkable. My advice would be to mix it at the bar like you would any other cocktail. It sounds like your wife would be more pleased with your homebrews if they had less of the "brew" flavor!

Mr. Wizard

I recently brewed a batch of Scottish ale. I tried a traditional recipe, using only pale malt and roasted barley. The brewing, transferring and bottling went great. I used Wyeast Scottish Ale yeast. Throughout the entire procedure the beer tasted delicious, smooth, malty, a little sweet with trace amounts of bitterness and hop flavor. I tasted a bottle about a week after bottling with the same result. About five days later, I opened one of my prize brews only to find a disagreeable amount of fruity taste (banana, mainly). I aerated my wort by shaking on brew day as usual and fermented at reasonable temperatures (60° to 65° F for the primary, then I racked and conditioned at 50° to 55° F). Why has my favorite brew gone to the monkeys?

Justin Rizza
Seattle, Washington

I could be totally wrong with my assessment of your problem, but I think the banana flavor was in the beer before you bottled it. When you tasted the beer prior to bottling, it was flat, and even after one week in the bottle, the carbonation level was probably low. The sample you took after the beer had been in the bottle for 12 days was probably fully carbonated. Carbonation helps release the aromas from the beer and increases the intensity of aroma. Fruity aromas are often associated with low wort aeration, especially with higher-gravity worts. When yeast growth is restricted by the lack of oxygen (used for unsaturated fatty acid and sterol production), ester levels increase.

The shaking method of wort aeration is not the most effective method. Your banana ale is most likely a result of low wort oxygen. Although there are wild yeasts that produce large amounts of isoamyl acetate (banana flavor), they produce this compound through aerobic growth. This would not occur in the bottle. My bet is the oxygen theory. In the future you may want to add a few more shakes to your routine or use an aeration device. ■

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

Fruit beer and Belgian ale

Brew a refreshing raspberry ale and a Belgian strong dark ale

2001

by Tess and Mark Szamatulski

Backyard barbecues, beach parties and great beer: Summer is prime time to brew the two beers we have chosen for this issue. We'll brew a light ale infused with the flavor of raspberries and a strong Belgian ale.

RASPBERRY ALE

The OG, FG, IBUs, SRM and ABV vary depending on the base beer.

Fruit beers are a varied bunch, covering many kinds of fruits and many styles of beer. When brewing a fruit beer, balance is key. The fruit must complement the base beer and not overwhelm it. It is also important to choose the base beer carefully. Some styles are simply not suited to the addition of fruit, such as IPAs and bitters. If the base beer is a classic style, the aroma and flavor of the style should come through along with the fruit. The aroma should be filled with fruit but balanced with malt and hops appropriate to the style of the base. Hop aroma is absent or minimal. The secret to brewing a great, award-winning fruit beer is balance.

The fruit beer we have chosen is a light, raspberry ale with a dash of wheat. A small amount of wheat complements the raspberry flavor and adds another facet to the beer. The aroma is of raspberry balanced with malt. There is a tiny presence of wheat and English hops. This is a very clean, mild, light fruit beer.

Commercial Beers to Try

Almost every brewpub has a fruit beer featured in its summer line-up. Some of the more interesting ones are watermelon (Commonwealth Brewery in Boston) and a blueberry wheat from Boston Beer Works. Bottled versions are Melbourn Brothers Apricot Ale and Strawberry Ale, Niagara Falls Brewing Company's Apple Ale, Pyramid Apricot Ale, Oxford Raspberry Wheat and Oregon Blackberry Porter.

Hops, Malt, Yeast & Fruit

Hops should be appropriate for the base beer. Hop bitterness should be kept low (less than 20 IBUs) so as not to compete with the fruit. Mild or fruity hops (Fuggles, Willamette or Tettnanger) can be used with restraint for flavor and with even more restraint, if at all, for aroma. Malt also should be appropriate for the base beer. Yeast strains should be fairly mainstream. Avoid some of the Belgian and wheat beer varieties that impart bubble gum, apple and clove flavor and aromas.

Some of the strains we favor for ales are London (Wyeast 1028), American (1056), British (1098) and Whitbread (1099). For lagers, try Kölsch (Wyeast 2565), North American Lager (2272), California Lager (2112) or Pilsen (2007).

There are many ways to introduce fruit into a beer. The easiest is to use pure, natural fruit flavoring when bottling. Depending on the base beer, 3 to 6 ounces can be used for a five-gallon batch. There are many varieties of this flavoring, from cherry to blueberry to grape. All of these should be available at

THE YEAR IN BEER

JANUARY:
Baltic Porter & German Pilsner

FEBRUARY:
Cream Stout & Dark Lager

MARCH:
Oktoberfest & American Brown Ale

APRIL:
American IPA & Old Ale

MAY:
Weizen & English Bitter

SUMMER:
Fruit Ale & Belgian Strong Dark Ale

SEPTEMBER:
Kölsch & Robust Porter

OCTOBER:
Celebration Ale & Pale Lager

NOVEMBER:
Strong Scotch Ale & Vienna Lager

DECEMBER:
English Barleywine & Doppelbock

your local homebrew shop. Fruit purées that come in 3-pound cans also can be used very successfully. They should be added to the secondary fermenter along with the beer. The purées come in aseptic (microorganism-free) cans, which you don't need to heat to make sterile. Be sure to add pectic enzyme with the fruit purée. This will prevent haze. After fermentation is complete, the beer should be racked to a tertiary fermenter to clear it.

If you use fresh fruit, it must be washed and chopped (with the exception of the berries), heated and held at 160° F for 20 minutes to pasteurize. It should be placed in the secondary in a sanitized bag to help contain seeds and small pieces of fruit. You can also juice the fruit, then pasteurize the juice and add it to the secondary fermenter.

Serving Suggestions

Serve in a champagne glass at 45° F with white chocolate bread pudding and raspberry sauce, garnished with fresh raspberries and dark chocolate shavings.

Raspberry Ale

(5 gallons, extract with grains)
OG = 1.045 to 1.046 FG = 1.012 (if using flavoring) FG = 1.015 to 1.016 (if using fruit) SRM = 13 IBU = 20 ABV = 4.3% (if using flavoring) or 5.4% (if using fruit)

Ingredients:

12 oz. U.S. crystal malt (40° Lovibond)
3.75 lbs. Muntons extra-light DME
1.25 lbs. Muntons wheat DME
4 oz. malto-dextrin
5 AAUs Fuggles (0.50 oz. of 10% alpha acid) (bittering)
2 AAUs Fuggles (0.50 oz. of 4% alpha acid) (flavor)
1 tsp. Irish moss
London Ale (Wyeast 1028) or Burton Ale (White Labs WLP023)
4 lbs. raspberries or 3 lbs. raspberry purée or 4 oz. raspberry beer flavoring
20 drops pectic enzyme
1-1/4 cup Muntons extra-light DME for priming

Step by Step

Bring 1 gal. of water to 155° F, add crushed grain and hold for 30 min. at 150° F. Strain the grain into the brewpot and sparge with 1/2 gal. of 168° F water. Add the DME, malto-dextrin and bittering hops. Bring the total volume in the brewpot to 2.5 gal. Boil for 45 min., then add the flavor hops and Irish moss.

Boil for 15 min., then remove the pot from the stove. Cool wort for 15 min. Strain into the primary fermenter and add water to obtain 5-1/8 gal. Add yeast when wort has cooled to 80° F. Oxygenate-aerate well. Ferment at 68° F for 7 days.

If using fresh raspberries, pasteurize at 160° F for 20 min. Rack the beer into secondary (glass or plastic), add raspberries or raspberry purée and pectic enzyme, then ferment for 1 week. Rack the beer into the third stage (glass carboy) and ferment until target gravity has been reached and beer has cleared (2 weeks). If using raspberry flavoring, add it at bottling time with the priming sugar. Prime and bottle. Carbonate at 70° to 72° F for 2 to 3 weeks. Store at cellar temperature.

Partial-Mash Option: Acidify the mash water to below 7 pH. Mash 2 lbs. U.S. two-row pale malt and the specialty grains in 1 gal. of water at 150° F for 90 min. Sparge with 1.5 gal. of water at 5.7 pH and 168° F. Then follow the extract recipe, omitting 1.5 lbs. of Muntons extra-light DME from the boil.

All-Grain Option: Acidify the mash water to below 7 pH. Mash 6.5 lbs. U.S. two-row pale malt, 1.5 lb. U.S. wheat malt and the specialty grains in 3 gal. of water at 152° F for 90 min. Sparge with 4.5 gal. of water at 5.7 pH and 168° F. Top kettle up to 6.5 gal. The total boil time is 90 min. Add 4 AAUs of bittering hops for the last 60 min. of the boil. Add the flavor hops and Irish moss as indicated by the extract recipe.

Helpful Hints: If your water is soft (below 50 ppm), add 3/4 tsp. gypsum and 1/4 tsp. non-iodized table salt to adjust for the style. If it's moderate (between 50 to 200 ppm), dilute it 1- to-1 with distilled water and add 1/4 tsp. non-iodized table salt. If it's hard (greater than 200 ppm), use bottled water and add 3/4 tsp. gypsum and 1/4 tsp. non-iodized table salt. Ready to drink as soon as it's carbonated. It will peak between 1 and 3 months and will last for up to 6 months at cellar temperatures.

BELGIAN STRONG DARK ALE

OG = 1.065 to 98+ FG = 1.014 to 24+
IBUs = 25 to 40+ SRM = 7 to 20
ABV = 7 to 12%+

Belgian strong dark ales are among the most complex beers you will drink. These beers are rich and complex with a deep flavor. A sustaining, warming brew, our version weighs in at 10% ABV. With the first sip, malt and candi sugar make themselves evident. The finish is soft, rich and malty.

Commercial Beers to Try

There are many fine examples of this style and luckily they are becoming more available in the United States. Here are some beers to sample: Pawel Kwak, Gouden Carolus, Scaldis (Bush), Rochefort 10, Chimay Grand Reserve (Blue) and our favorite, Westvleteren 12° (Yellow Cap). The commercial versions are all uniquely different.

Hops, Malt, Sugars, Spices and Yeast

Hops are used for bittering, flavor and occasionally in small amounts for aroma. The following varieties should be used: Styrian Goldings, German Hallertau Hersbrucker, Czech Saaz and Kent Goldings. For the extract brewer, use British malt extract and specialty grains. For the all-grain brewer, use Belgian two-row pale or pilsner malt as a base, along with specialty grains, including Belgian cara-Munich, Belgian aromatic, Belgian Special B, Belgian or German Munich, Belgian biscuit, Gambrinus honey malt and 1-1/2 to 3-1/2 ounces

of British or Belgian chocolate malt.

Belgian candi sugar provides alcohol and imparts a pleasing fullness and a subtle nuance. It comes in three colors: clear, amber and dark. Use 1 to 2 pounds in a 5 gallon recipe. In some brews, up to a pound of invert sugar (Lyle's Golden Syrup) can also be used.

The Belgians use special and unique spices in some of their beers. Some of the more familiar spices are grains of paradise, cumin, coriander, bitter or sweet orange peel and anise. Yeast strains that should be used for their alcohol tolerance and special flavor characteristics are Belgian Strong Ale (Wyeast 1388), Belgian Abbey 2 (1762), Belgian High Gravity (3787), Belgian Abbey (1214) and Belgian Golden Ale (White Labs WLP570).

Serving Suggestions

Serve in a chalice glass at 55° to 59° F with petite filet mignon smothered in a truffle, porcini mushroom and Belgian strong dark ale sauce.

Belgian Strong Dark Ale

(5 gallons, extract with grains)
OG = 1.098 to 1.099 FG = 1.020
SRM = 32 IBU = 24 ABV = 10.0%

Ingredients:

14 oz. Belgian cara-Munich malt
8 oz. Belgian biscuit malt
6 oz. Belgian aromatic malt
2 oz. British chocolate malt
9.75 lbs. Muntons extra-light DME
1.5 lbs. Belgian amber candi sugar
4 oz. malto-dextrin
6.5 AAUs Fuggles (1.25 oz. of 5.2% alpha acid) (bittering)
2.6 AAUs East Kent Goldings (0.50 oz. of 5.2% alpha acid) (flavor)
1 tsp. Irish moss
1 AAU German Hallertau Hersbrucker (0.25 oz. of 4% alpha acid) (aroma)
1.3 AAUs Styrian Goldings (1/4 oz. of 5.2% alpha acid) (aroma)
Belgian Strong Ale (Wyeast 1388) or Belgian Golden Ale (White Labs WLP570)
1-1/4 cup Muntons extra-light DME for priming

Step by Step

Bring 1 gal. of water to 160° F, add crushed grain and hold for 30 min. at 150° F. Strain the grain into the brewpot and sparge with one gal. of 168° F water. Add the DME, Belgian candi sugar, malto-dextrin and bittering hops. Bring the total volume in the brewpot to 4 gal. Boil for 45 min., then add the flavor hops and Irish moss. Boil for 13 min., then add the aroma hops. Boil for 2 min., then remove from the stove.

Cool wort for 15 min. in an ice bath or chill with wort chiller. Strain into the primary fermenter and add water to obtain 5-1/8 gal. Add yeast when wort has cooled to below 80° F. Oxygenate-aerate well. Ferment at 70° F to 72° F for 7 days, then rack into secondary (glass carboy). Ferment until target gravity has been reached and beer has cleared (6 weeks). Prime the beer (in the carboy) with another dose of the same strain of fresh yeast 3 days before bottling. Carbonate at 70° to 72° F for 4 to 5 weeks. Store at cellar temperature.

Partial-Mash Option: Acidify the mash water to below 7.2 pH. Mash 1.25 lbs. Belgian two-row pilsner malt and the specialty grains in 1 gal. of water at 150° F for 90 min.

Sparge with 1.5 gal. of water at 5.7 pH and 168° F. Follow the extract recipe, omitting 1.75 lbs. of extra-light DME from the boil.

All-Grain Option: Acidify the mash water to below 7.2 pH. Mash 15.25 lbs. Belgian two-row pilsner malt and the specialty grains in 5.5 gal. of water at 150° F for 90 min. Sparge with 5.25 gal. of water at 5.7 pH and 168° F. The total boil time is 105 min. Add 5.2 AAUs of bittering hops for the last 90 min. of the boil. Add the candi sugar, flavor hops, Irish moss and aroma hops as indicated by the extract recipe. To make this mash more manageable, you can decrease the pilsner malt by 5 lbs. and add 3 lbs. Muntons extra-light DME into the boil. This will decrease the mash water to 4.25 gal., the sparge water to 5 gal., and the boil time to 90 min.

Helpful Hints: If your water is soft (below 50 ppm) it is proper for the style. If it is moderate (between 50 to 200 ppm), dilute it 1-to-1 with distilled water. If your water is hard (greater than 200 ppm), use spring water. This ale is ready to drink after 2 months of carbonation. It will peak between 6 and 12 months and will last for up to 3 years at cellar temperatures. ■

Tess and Mark Szamatulski are the owners of Maltose Express in Monroe, Connecticut. They are the authors of "Beer Captured" (Maltose Press, 2000).

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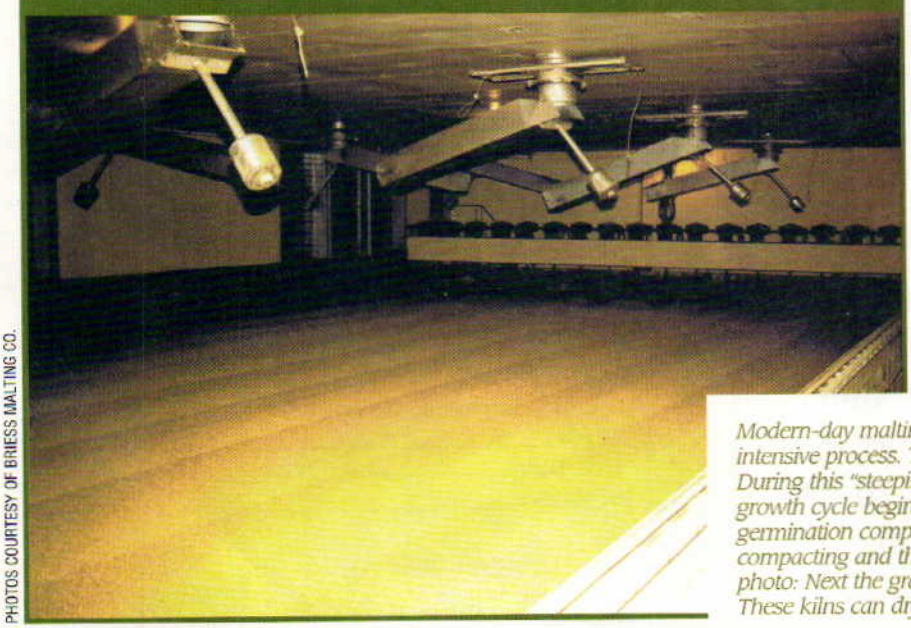


PHOTOS COURTESY OF BRIESS MALTING CO.

WE ALL KNOW THAT BEER IS NOTHING BUT FERMENTED GRAIN JUICE. BUT HAVE YOU EVER STOPPED TO THINK HOW CURIOUS IT IS THAT WE DON'T JUST GO OUT INTO THE FIELD, CUT SOME BARLEY AND PLUNK IT RIGHT INTO OUR MASH TUNS? INSTEAD, WE EXTRACT THAT ALL-IMPORTANT JUICE ONLY FROM GRAIN THAT HAS BEEN MALTED! CONSIDERING THAT MALTING IS A FAIRLY COMPLEX ENZYMATIC, THERMAL AND MECHANICAL PROCESS INVOLVING MOISTENING, GERMINATING AND DRYING THE GRAIN, ISN'T IT AMAZING THAT MALTING HAS BEEN GOING ON FOR THOUSANDS OF YEARS, AND, UNTIL VERY RECENTLY, APPARENTLY WITHOUT ANYBODY HAVING ANY IDEA ABOUT THE SCIENCE BEHIND IT?

Why does malted grain make better beer than does raw grain? The answer lies in the difference between nature's intent for the barleycorn, which is reproduction, and our preferred use of it, which is beer-making. The barleycorn is a storehouse of all the vital nutrients needed by the next generation of barley to grow into a mature plant. We try to divert that flow of nutrients from the plant to the brew by altering the kernel's chemistry, and for that we need the maltster's unique craft. There are enzymes in the grains that serve as nature's catalysts, turning the kernel's raw materials into the building blocks of new life.

It is, of course, easy for modern brewers with a scientific understanding of enzymatic conversion to figure out how best to prepare grain for brewing. Yet the workings of enzymes were discovered only very

Modern-day malting is a highly specialized, capital- and energy-intensive process. Top photo: First the grain is sprayed with water. During this "steeping" process, the kernels absorb water and the growth cycle begins. Middle photo: Turners mix the kernels in the germination compartment. This keeps the grain bed from compacting and the sprouts from growing together. Bottom photo: Next the grain is dried by currents of hot air in a kiln. These kilns can dry several thousand pounds of grain at a time.

BREWING GRAIN EXPLAINED

by Horst D. Dornbusch

THE HISTORY OF MALTING, FROM THE BRONZE AGE TO THE MODERN DAY

recently, in 1890, by the British chemist Cornelius O'Sullivan. But how brewers before O'Sullivan figured out that malted grain is better than raw grain is anybody's guess. We can only surmise that they stumbled upon the right process through trial-and-error experimentation and a dose of plain good luck.

The Stone Age Inventors of Beer and Writing

The world's very first documented brewers were the Sumerians, an early Stone Age culture that emerged some eight to ten thousand years ago, between the rivers Euphrates and Tigris, in a land we now call Mesopotamia in southern Iraq. These remarkable people invented both brewing and writing and thus made what are perhaps the two most important contributions ever to human civilization!

These early Middle Eastern brewers apparently did not practice the art of malting. We believe that the Sumerians discovered beer-making by accident. A forgetful baker — probably the lady of the house or her maid — might have left her dough out during a rain storm. When the rays of the returning sun warmed the earthenware mixing bowl, it became a combination of mash tun and open fermenter, in which the grain's enzymes, together with airborne yeasts, converted the bread dough's starches into sugars and the sugars into alcohol.

Perhaps out of innate curiosity, the careless baker tasted the rainwater ale she had so inadvertently concocted and appreciated the sour, refreshing taste of the beverage — and the heady after-effect. There must have been deliberate attempts to replicate this accidental brew.

Later it became the practice to partially bake the dough first, before it was used for beer making. The gentle, moist baking probably activated the grain's enzymes similarly, though less efficiently, in the way germination does the same trick in a modern malting house.

The Babylonians conquered the Sumerians during the second millennium BC, subsequently learning how to brew from them. The Babylonians later taught the art of brewing to the Egyptians, who practiced it with great skill until the seventh century AD, when the prophet Mohammed took a stroll from Mecca to Medina and subsequently declared drinking alcohol a sin.

Deep in the Teutonic Forests: The First Malt

The Germanic tribes of central and northern Europe, though comparative late-comers to the game of brewing, were probably the first maltsters. They started beer-making only in the Bronze Age, some three thousand years ago. Though there was apparently no contact between the Teutonic forest inhabitants and the Middle Eastern delta dwellers at the edge of the desert, the forerunners of modern Germans initially made their beer the same way, from baked bread loaves. They crumbled the loaves into a crock of water, put the entire mess out into the sun and waited for airborne yeasts to ferment it. Such were the humble beginnings of what we now revere as a magnificent beer culture. We know this for a fact, because the oldest archeological evidence of beer-making in present-day Germany is a crock that contains traces of bread beer. It belongs to the Hallstadt culture and was found in the grave of a gentleman who died about 800 BC near present-day Kulmbach in northern Bavaria. The crock is now in the Beer Museum in Kulmbach.

It took these tribes about a

thousand years to learn the art of malting. How it came about, we don't know, but that they discovered this all-important technique we do know from their tales and myths, passed on by word of mouth through the ages. These old Germans, unlike the Sumerians, didn't yet know how to write. (They started to practice penmanship only about fifteen hundred years ago.) But their oral legends, as well as Roman records of the time, tell us that, around the start of the first millennium AD, these tribal folk had evolved an elaborate method of treating the grain before it was used for mashing. They usually made a full year's supply of malt right after the harvest. They steeped sacks of grain in lakes or streams until the kernels began to sprout and the acrospire was about as long as the grain itself. They then spread out the moist, sprouted grain in a thin layer to dry near an open fire. In what we today know as Finland, people built steam-bath houses (saunas), which doubled as drying and roasting sheds for grain.

The Medieval Maltster Goes Pro

By the Middle Ages, malting had become a specialized profession in central Europe. The traditional malting plant in those days was usually a stone structure built near a stream or a lake for an ample supply of cool water. The building had a deep cistern for steeping the raw grain, a stone floor for germinating and then drying the grain, and small wall openings for temperature control and ventilation. After steeping, the grain was deposited in a large heap on the stone floor near the back of the building. There it would start to sprout and develop heat. As germination progressed, the maltster would use a wooden shovel to move the grain farther and farther to the front of the building, and to spread it out in ever-thinner layers. Before nightfall, he would often lift the grain with his shovel and allow it to cascade back to the floor to dissipate heat and reduce moisture. If the grain got too dry he would hand-sprinkle it with water. At any one time, a malt house would contain several rows of grain, from the back to the front of the building, at different stages of germination. Since temperature and moisture control depended on atmospheric conditions, malting was mostly confined to the cool months of winter.

Once germination was complete, the maltster moved the grain to the direct-heat kiln, which was a separate, dome-shaped structure with a perforated, tiled floor and a furnace underneath. The grain was dried by the fire's combustion gases, and the moisture escaped by natural draft through an opening in the center of the ceiling. To keep the grain bed from burning or drying unevenly, the maltster would occasionally agitate it with his shovel. Malting under these conditions was a fine art. More often than not, the malt that resulted from this process was of uncertain color, flavor and enzymatic quality, and the characteristics of the beer brewed with such malt were no more predictable.

IN BRITAIN, malt was dried over wood fires for centuries. The floor of the kiln was woven wire.

The British Invent Industrialized Malting

In Britain, too, malt was dried over open wood fires, for centuries. The floor of the kiln was often made of woven wire, on which the moist green malt was spread in a layer of perhaps one-and-a-half inches. There the malt was gently dried for about an hour by burning five-foot long spars (known as faggots) of oak or ash. The grain was then allowed to cool off, before it underwent a second, short drying cycle at high heat, during which it needed to be furiously turned to keep it from charring. This brown malt was the standard raw material for the early parti-gyle beers, mainly the high-gravity "stout porters" (or just "stouts") made from the first runnings and the lower-gravity "porter" beers from the second runnings. In the early eighteenth century several British maltsters, especially in the coal-mining areas, switched to coke as a fuel for their kilns, since coke fires were easier to control than wood fires, and were thus less likely to scorch the grain.

The credit for making the first truly modern malt goes to Daniel Wheeler, who, in 1817, took out a patent on his "Improved Method of Drying and Preparing Malt." Wheeler replaced the traditional direct-fired kiln with an iron cylindrical drum, in which the grain is blow-dried by clean, hot air rather than penetrated by dirty, hot smoke. Thus the malt no longer picked up residues from coke or wood fuels, flavors that used to be passed on to the beer. Apparently the idea for his kiln came to Wheeler while he was watching coffee being roasted. With Wheeler's device maltsters could, for the first time, produce clean-tasting malt of predictable color.

It was Wheeler's invention — more than anything else — that spawned the explosion of beer styles in Britain and in Germany during the nineteenth century. Before Wheeler, a brown ale, for instance, was simply made with 100 percent brown malt. After Wheeler, brewers could use enzyme-rich pale malts as a foundation grain for any batch and then mix in varying amounts of darker grains, such as chocolate or black malt, to achieve the proper color and flavor — and improve their extract efficiency. The first beer style to benefit from Wheeler's new method was the porter, the second-runnings brother of the stout. It could finally become

a first-runnings beer all its own.

Even the Germans took notice of these British brewing advances. None other than the famous Herr Gabriel Sedlmayr, mighty brewer-owner of the venerable Spaten brewery in Munich, went to England in the eighteen-thirties to see for himself what the fuss was all about. Upon his return to Munich, he integrated Britain's progressive brewing technology into his own operation—and revolutionized the world of lager making.

Perversely, you can often measure success by the extent to which your government takes notice of your activities and starts taxing them. This is what happened to the maltsters in Britain, when, in 1842, the government passed the Master Maltsters Act. The Act strictly licensed and taxed the new technology by stipulating that only maltsters holding a government "patent" could produce highly roasted malts — hence the name "patent malts" for the darkest varieties.

An Endless Variety of Modern Malts

Nowadays, malting is a highly specialized, capital- and energy-intensive industry. Modern kilns are giant, indirectly heated chambers of various shapes for drying several thousand pounds of grain at a time. Adjustable flaps channel hot air through the grain to produce the brewer's malt.

Specialty grains such as crystal malts or cara-malts are produced in giant, closed roasting drums that also are heated indirectly, just around the cylinder, initially without blowing hot air through the grain itself. This enclosed heating preserves the green malt's moisture content longer than does direct blow-drying. It has the effect of stewing — or pre-mashing — the grain, which is to say, of converting virtually all starches to sugar. Subsequently this grain is dried like regular malt, for at least two hours or longer, during which the sugars become hard, glassy, and "caramelized" or "crystallized."

If added to the brewer's mash, such crystal malts and cara-malts contribute body, mouthfeel and head stability, as well as a malty-nutty, toffee-like, biscuity or even toasty flavor to the beer. For these reasons, the palest of the cara-malts — also known as dextrin malts because of their high content of complex, unfermentable sugars — have become a common addition to the grain bill of many top-notch lagers around the world.

In today's beer making, as in the first brews of mankind, malting and mashing are really two steps in the same process. The goal of both steps is to convert the harvested grain into a raw material from which, through the process of mashing, sparging and lautering, a nourishing juice — a wort — can be extracted for subsequent fermenting. We now know that all conversions in the grain are the result of specialized organic catalysts, which we call enzymes.

These catalysts change droplets of germ oil into watery substances; they change large-molecular, haze-forming proteins into smaller ones that reside invisibly in the beer, where they contribute to the drink's head and body; and they change starches into sugars that the yeast turns into alcohol and effervescent carbon dioxide bubbles. The maltster starts the conversion process in the germination chamber and the kiln. The brewer finishes it in the mash tun. Then it is the yeast's turn to have a go at the resulting juice. And then it is our turn. Cheers! ■

Horst D. Dornbusch is founder of the Dornbusch Brewing Company of Ipswich, Massachusetts and the author of "PROST! The Story of German Beer" (Brewers Publications, 1997). The book recounts the history of German beer, brewing and politics. He also has written two volumes in the Brewers Publications Classic Beer Style Series: "Altbier" (No. 12, 1998) and "Bavarian Helles" (No. 17, 2000).

HOW MALT IS MADE

Barley — like most grains — is made of starches, proteins and some fat. On the stalk, barley contains between 13 percent and 20 percent water, depending on the amount of rainfall and sunshine during the growing season. The rest is made up of dry substances. Of those, some 58 percent to 65 percent is starch, the raw material for fermentation. Proteins, which contribute body and mouthfeel to the brew and are responsible for the foamy white head, account for roughly 9 percent to 11.5 percent of the average barley's dry weight. Fats, which make up about 2 percent of the barley's dry weight, need to be eliminated before we turn the barley into beer. In the malt house and in the mash tun, chemical reactions are initiated that promote these objectives.

At the start, in the malt house, the barley is steeped and then allowed to germinate. The whole process may last a week, at the end of which barley is called "green malt." During this time, enzymes are secreted within the green malt that convert, or "modify," nutrients for use by the growing new shoot called the acrospire. Importantly, fats are reduced — by enzymes called lipase — into watery substances that disappear as plant food. But we want to preserve the barley's starches and proteins for our beer. So the maltster moves the green malt into a heated kiln to dry it out and kill the little sprout. The drying time and temperature depend on the desired color and flavor characteristics of the finished product — called brewer's malt — and lasts anywhere from several hours to several days at a temperature ranging from 110° to 220° F. —*H.D.*

Recipes revealed

By Dawnell Smith

• alpha king pale ale • magic hat #9 • labatt blue • tire biter ale • saison farmhouse ale •

PHOTO BY CHARLES A. PARKER/IMAGES PLUS

THE REPLICATOR, our resident researcher of commercial clone recipes, tells inquiring readers how to brew five lip-smacking summer beers

We launched the Replicator column nine months ago, and since then, we've been bombarded by letters and e-mails from readers who want clone recipes for their favorite beers. Because we won't be publishing another issue until September, we set aside space for a few extra recipes this time around. In the following pages, the intrepid Replicator offers tips, techniques and suggested ingredients for a tasty array of summer beers. The Rep relies on sleuthing skills and her expertise as a pro brewer to devise these best-guess recipes.

As a flatlander who visits Vermont often, I have developed a deep appreciation for the state's beers. The most unique ones come from Magic Hat. I've visited the brewery in Burlington, and it is just as funky as their beers. The sad thing is that Magic Hat doesn't seem to be widely distributed in New York City. I'd love a recipe for #9. And how the heck do they make it taste like apricots?

Bruce Wingate
New York, New York

You may think the brewers from Vermont pull magic out of their tap when making #9, but they actually use apricot essence — a natural fruit flavoring that comes as a liquid extract — in a solid beer base. "We feel #9 has stood the test of time because, although it does contain fruit essence, the fruit aroma and flavor is not overpowering. It allows a subtle and well-balanced malt and hop profile to show through," explained brewer Matt Cohen.

Originally created as a summer seasonal by brewmaster Bob Johnson, #9 now reigns as the most popular and best-selling beer of the bunch for the Burlington brewery.

In Cohen's words, #9 is "not quite a pale ale," so it fits many of the parameters of that style. Cohen provided an all-grain recipe that includes mostly English two-row pale malt, plus 11 percent malted wheat and three percent crystal malt (60° Lovibond). He uses a single-infusion mash temperature of 152° F to yield wort with an original gravity of around 1.048. For hops, use Fuggles for bittering, Tettnanger for flavor and Cascade for aroma to get about 20 IBUs.

Magic Hat uses an open fermentation system and ferments #9 at 75° F with an English ale yeast. "Unfortunately, we can't give away all of our secrets," added Cohen. "However, the key to this beer is subtlety, so we recommend adding a conservative amount of apricot essence or purée toward the end of the process. Go slow until you achieve your desired result."

If you want more information, call (802) 658-2739 or check out www.magichat.net.

Magic Hat Brewing Company #9

(5 gallons, extract with grains)
OG = 1.048 FG = 1.010 IBUs = 20

Ingredients

5 lbs. Muntons plain light DME
3 oz. crystal malt (60° Lovibond)
12 oz. wheat malt
3 AAUs Fuggles (2/3 oz. at 4.5% alpha acid)
2.6 AAUs Tettnang (0.5 oz. at 5.2% alpha acid)
1.5 AAUs Cascade (0.25 oz. at 6% alpha acid)
1 tsp. of Irish moss

British Ale II (Wyeast 1335) or English Ale (White Labs WLP002)
3.3 lbs. Oregon Fruit Products apricot purée *or* 3 oz. apricot flavoring (liquid extract)
3/4 cup corn sugar for priming

Step by Step

Steep crystal and wheat grains in 5.5 gallons of water to get a temperature of 152° F for 45 minutes. Remove grains and add Muntons DME. Bring to boil for 30 minutes. Add Fuggles hops. Boil 30 minutes, then add Tettnang hops and Irish moss. Boil 30 minutes, add Cascade hops and remove from heat. Cool to about 75° F and transfer to fermenting vessel with yeast.

Ferment at 75° F for three to five days, then transfer to a secondary vessel with 3.3 lbs. (one can) of apricot purée or 3 ounces of liquid apricot flavoring for approximately five days. You can adjust the amount of apricot to taste in subsequent batches. (Many homebrew shops carry fruit flavorings and Oregon Fruit Products aseptic purées; ask at your local shop or mail-order outlet.) Prime with corn sugar, then bottle or keg.

All-Grain Option

Omit dry malt extract and mash

7.5 lbs. British pale malt with other malts in 8.5 quarts of water to get a single-infusion mash temperature of 152° F for 45 minutes. Sparge with hot water of 170° F or more to get 5.5 gallons of wort. Bring to boil and use the above hopping and fermentation schedule.

I am looking for a good recipe that will help me to duplicate a Canadian lager. I really like the body and flavor of Labatt Blue. Can you help me to clone this excellent beer?

John MacKay
via e-mail

Finding a good source for a clone recipe from a major brewery like Labatt takes a measure of tenacity and a ton of patience. I tried both, but didn't have much luck. Rather than waiting, we can brew a clone of this pilsner lager by using light malt extract and German aromatic hops.

Originally called Labatt Pilsener when it debuted in 1951, Labatt Blue got its nickname from fans of the Winnipeg Blue Bombers of the Canadian Football League. It now reigns as the number-one selling beer in Canada.

The Labatt Brewing Company was founded more than 150 years ago in London, Ontario, but now has international ties with the Belgian-based company, Interbrew SA. Interbrew is a brewing conglomerate that makes more than 120 products worldwide.

The Labatt Web site (www.labatt.com) describes Labatt Blue as a light, crisp and delicate beer made with German aromatic hops. Though the site divulges little about the actual ingredients and brewing procedure, you can start with some pilsner basics and then play around with hops for the right spice character or malts for color and maltiness.

Labatt Blue

(5 gallon, extract with grains)
OG = 1.048 FG = 1.010
IBUs = 20 to 25

Ingredients

5.5 lbs. Muntons plain extra-light dried malt extract
4 AAUs Hallertau (1 oz. at 4% alpha acid)
1.3 AAUs Hallertau (1/3 oz. at 4% alpha acid)
3.5 AAUs Saaz (1 oz. at 3.5% alpha acid)
1 tsp. Irish moss
Any lager or Canadian lager yeast strain (Wyeast 2272 or White Labs WLP800)
3/4 cup corn sugar for priming

Step by Step

Heat 5.5 gallons of water and add dry malt extract. Bring to boil for 30 minutes. Add 1 ounce Hallertau hops. Boil for 30 minutes, then add 1/3 ounce Hallertau hops. Boil for 15 minutes and add Irish moss, then boil another 15 minutes and add Saaz hops. Remove from heat. Cool to about 50° F and transfer to fermenting vessel with yeast. Ferment at 50° F until complete (ten days to two weeks), then transfer to a secondary vessel for two to three weeks. Rack into bottles or keg with corn sugar and maintain at fermentation temperature for three to five days. Finally, drop temperature to 35° to 40° F for two or more weeks.

All-Grain Option

Omit extract and mash 7.75 lbs. pale or pilsner malt in 7 quarts of water to get a single-infusion mash temperature of 152° F for 45 minutes. (You could also do a step or decoction mash with rest periods at 122° and 152° F.) Sparge with hot water of 170° F or more to get 5.5 gallons of wort. Bring to a boil and use the above hopping and fermentation schedule.

I just began homebrewing a few months ago. I started trying a much wider array of beer styles when I realized how many great flavors exist beyond the few that my friends generally drink. While it's easy to find information on stouts, pilsners and various ales, I haven't found much on one style I have really come to enjoy: kölsch ales. In particular, I love Tire Biter Ale from Flying Dog Ales in Denver, Colorado. I know "Style Calendar" will include a kölsch in September, but I don't think I can wait that long! I'm sure anyone who has tried Flying Dog's "Litter of Ales" would have to agree that they make exceptional beer. And their labels, illustrated by Ralph Steadman, are the perfect bottle dressing. Come on, throw this old dog a bone!

Ted Amelse
Crystal Lake, Illinois

Thirst-busting kölsch beers look very pale, taste crisp and clean and contain the slight fruity flavors of many ales. Unlike American golden ales, kölsch beers tend to taste more delicate and subtle, partly due to the maturation period of two to six weeks at cold temperatures (32° to 40° F). The name comes from the region in Germany where these beers were first brewed.

The pale gold Tire Biter from Flying Dog has mild strength and bitterness along with the clean, quenching allure of any good kölsch. The brewery's 50-barrel brewhouse can handle up to 35,000 barrels a year and currently supplies Tire Biter, Doggie Style Pale Ale and other canine-name beers to 25 states and the United Kingdom.

According to Elis M.Owens, the director of brewery operations, the grain bill for Tire Biter includes two-row Northwestern pale malt, 12 percent malted wheat malt and 7

percent Munich malt. For hops, go with Perle to start and Hallertau to finish.

Using Wyeast 1007 (German Ale), fermentation should take place at 60° F until there are no more changes in specific gravity. Then leave it at fermentation temperature for six more days for the diacetyl rest. Follow by cold-conditioning for four to five days at 40° and four to five days at 34° F.

Owens uses enough gypsum to yield 130 parts per million of calcium in the mash. Gypsum ($CaSO_4$) helps with clarification and imparts a dry, crisp character to the beer. If you have soft water, just add a few teaspoons of gypsum to the mash water before heating it. But it's important that you know your water content before adding anything, since too much can make the beer harsh. *(See "Hard Facts About Water" in the May 2000 issue.)*

For more information about Flying Dog and its pack of beers, call (303) 292-5027 or check out www.flyingdogales.com.

Tire Biter Ale

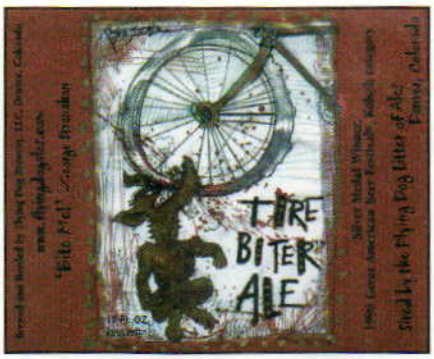
(5 gallons, extract with grains)
OG = 1.046 FG = 1.009 to 1.010
IBUs = 19 to 21

Ingredients

5 lbs. Bierkeller plain extra-light liquid malt extract
1 lb. malted wheat
10 oz. Munich malt
Gypsum to yield 130 ppm calcium in mash
5.1 AAUs Perle hops (1 oz. at 5.1% alpha acid)
4 AAUs Hallertau hops (1 oz. at %4 alpha acid)
1 tsp. Irish moss
German Ale yeast (Wyeast 1007)
3/4 cup corn sugar for priming

Step by Step

Steep wheat and Munich malts in 3 gallons of water at 153° F for 45 minutes. Remove grains and add extract. Bring to boil for 30 minutes. Add Perle hops. Boil for 45 minutes, then add Irish moss. Boil



for 28 more minutes, add Hallertau hops. Boil for two more minutes and remove from heat. Cool wort, transfer to fermenting vessel and top up to 5 gallons. Pitch yeast at 65° F.

Ferment at 60° F until complete (7 to 10 days), then leave at that temperature for another six days for a diacetyl rest. This will help maintain the delicate nature of the style. Prime, rack into bottle or kegs and drop temperature to 40° F for 4 to 5 days, then (if possible) to 34° F for 4 to 5 additional days.

All-Grain Option

Omit extract and mash 5.5 lbs. pale malt with other malts in 9.5 quarts of water to get a single-infusion mash temperature of 153° F for 45 minutes. Sparge with hot water of 170° F or more to get 5.5 gallons of wort. Bring to boil and use above hopping and fermentation schedule.

I have been searching the Internet recipe files for a clone recipe of the wonderful elixir Saison, brewed by the New Belgium Brewing Company in Fort Collins, Colorado. Their version of this style isn't as sweet as some that the other micros and brewpubs produce. I would appreciate any assistance regarding this beer.

Tim Kober
Billings, Montana

New Belgium's Saison Belgian Style Farmhouse Ale has deep agrarian roots and a traditional spicy character. The style originated more than a century ago, when farmers in parts of Belgium and France made beer for the family table. Usually, they brewed these beers in the winter for consumption during the heavy work season from spring to fall. These amber ales pack enough alcoholic power to mature nicely over many months, yet taste smooth and quenching to satiate the most thirsty of farmhands.

Notably crisp and tart, saison beers often have a strong citrus character, an orange hue and a spicy flavor. That's due to hops and spices, like orange peel, anise and some other herbs.

New Belgium's Peter Bouckaert considers the growing popularity of saison beers in American craft-breweries as a reflection of the "style-ification" of beer in the United States. "There are a bunch of different beers that, often by accident, got brewed in the same area," Bouckaert explained. "That's how a beer becomes a 'style.'"

Rather than following style guidelines, Bouckaert prefers to experiment. He set out to make New Belgium's saison by playing around with spices, yeast strains, salts and the brewing process itself. He uses a pale malt base, augmented by fairly light caramel malts, to create an orange hue. Bouckaert mentioned cardamom, orange peel and coriander as appropriate spices to add to the saison kettle.

For bitterness, he recommends a range of 25 to 29 IBUs with an assertive addition of aroma hops

"depending on your spicing." Bouckaert says he uses two yeast strains in the New Belgium version, but didn't offer any additional insights. If one strain sounds simpler, a suitable choice for homebrewers would be White Labs Belgian Saison 1 (WLP565).

"Ferment in the high temperature range, a few degrees below killing the yeast, but be careful not to produce off flavors," says Bouckaert. Then plan to put it in the cellar for a few months to let it reach its full potential. Though many saison brewers condition the beer in the bottle, New Belgium does not use this practice.

For more information on New Belgium Brewery and its beers, look them up at www.newbelgium.com or call (888) 622-4044 or (970) 221-0524.

New Belgium Saison Belgian Style Farmhouse Ale

(5 gallons, extract with grains)
OG = 1.058 FG = 1.012
IBUs = 25 to 29

Ingredients

6.5 lbs. Laaglander plain light DME
10 oz. carapils
10 oz. crystal (20° Lovibond)
5.25 AAUs Hallertau hops
(1.5 oz. of 3.5% alpha acid)
5 AAUs of Strisslespalt hops
(1.25 oz. of 4% alpha acid)
(or use Hallertau as substitute)
1 to 2 tsp. cardamon
1 to 2 tsp. orange peel
1 to 2 tsp. coriander
1 tsp. Irish moss
Belgian Ale (Wyeast 1214 or White Labs WLP-565)
3/4 cup corn sugar for priming

Step by Step

Steep carapils and crystal malts in 5.5 gallons of water at 153° F for 45 minutes. Remove grains and add extract. Bring to rolling boil for 30 minutes. Add Hallertau hops. Boil 45 minutes, then add Strisslespalt hops, spices and Irish moss. Boil 15 more minutes and remove from heat. Cool to about 80° F and transfer to fermenting vessel with yeast.

Ferment at 79° to 84° F until complete (3 to 7 days), then leave at that temperature for another six days for warm conditioning. Rack into bottle or kegs with corn sugar for a few days, then drop the temperature to 40° F for three to four additional weeks.

All-Grain Option

Omit extract and mash 8.25 lbs. pale malt with other malts in 9 quarts of water to get a single-infusion mash temperature of 153° F for 45 minutes. Sparge with hot water of 170° F or more to get 5.5 gallons of wort. Bring to boil and use above hopping and fermentation schedule.

I'm looking for a clone recipe of Alpha King from Three Floyds Brewery in Hammond, Indiana. Any help would be appreciated.

Ted Enright
via e-mail

With ten different malts and two yeast strains, Alpha King Pale Ale is a beer to reckon with. Especially since it's loaded with hops, hops and more hops. In fact, Nick Floyd founded the brewery in 1996 with the intent of creating big, bold hoppy beer to his liking.

The beer has such a hop-head reputation that it provides the namesake to the Alpha King Challenge, which puts big hoppy beers into a secondary judging event during the Great American Beer Festival. The idea of the challenge is to find the most hoppy beer with the best balance. (Last year, Sockeye Red from Midnight Sun Brewing in Anchorage, Alaska, won the Challenge.)

Floyd provided a recipe to help homebrewers make something close to the real thing. Ideally, go all-grain if you can, in order to include the Belgian two-row malt, which makes up about 50 percent of the grain bill in Floyd's recipe. The rest of the malt includes American pale malt and small portions of caraMunich, Special B, caramel, carapils, red wheat and melanoidin.

As soon as the resulting wort gets boiling, add Magnum and Columbus hops, then finish with Cascade at the very end. Then, just to boost the flavor more, add three types of dry hops to the fermenter.

Floyd uses a blend of yeasts, but homebrewers should do well with virtually any American ale strain. From there, just wait for the beer to condition, then challenge the real Alpha King to a dual with your own.

If you want to try Alpha, head to the brewery in Hammond, Indiana (though the business office now resides in Munster). Check them out at (219) 922-3565 or go to www.threefloyds.com.

Alpha King Pale Ale

(5 gallon, extract with grains)
OG = 1.062 to 1.070 FG = 1.014 to 1.018 IBUs = 62-66

Ingredients

6.5 Alexanders pale liquid malt extract
1 lb. Belgian pale malt
2 oz. caraMunich dark
1.5 oz. caraMunich
1.5 oz. DeWolf-Cosyns Special B
1.5 oz. carapils
1.5 caramel malt (60° Lovibond)
1.5 oz. melanoidin malt

0.5 oz. red wheat
7 AAUs Magnum hops
(0.52 oz. of 13.5% alpha acid)
7 AAUs Columbus
(0.58 oz. of 12% alpha acid)
11 AAUs Cascade hops
(2 oz. of 5.5% alpha acid)
Dry hops: 1 oz. Cascade, 1 oz. Columbus and 1 oz. Centennial
American Ale yeast (Wyeast 1056)
1 tsp. Irish moss
3/4 cup corn sugar

Step by Step

Steep specialty malts in 5.5 gallons of water at 154° F for 45 minutes. Remove grains and add extract. Bring to boil and add 1/2 ounce each of Magnum and Columbus hops. Boil for 75 minutes, then add Irish moss. Boil 15 more minutes, add 2 ounces Cascade hops and remove from heat. Cool to about 65° F and transfer to fermenting vessel with yeast.

Ferment at 68° F for three to five days until active fermentation ceases, then rack to secondary with dry hops for another week. Rack into bottle or kegs with corn sugar and leave at fermentation temperature for a few days. Drop the temperature to 40° F for a week, then (if possible) go to 34° F for yet another week.

All-Grain Option

Omit extract and mash 4 lbs. American two-row malt and 5.5 lbs. Belgian two-row with other malts in 12 quarts of water to get a single-infusion mash temperature of 154° F for 45 minutes. Sparge with hot water of 170° F or more to get 5.5 gallons of wort. Bring to a boil and use the above hopping and fermentation schedule. ■

Dawnell Smith lives in Anchorage, Alaska, where she is a freelance writer and head brewer at Sleeping Lady Brewery. A longtime homebrewer, she studied professional brewing at the American Brewers Guild and also has worked at the Midnight Sun and Skagway micros.

2001

A LABEL ODYSSEY

From distant galaxies, orbiting asteroids and far-flung moons! From Ohio, Minnesota and Maryland! The labels arrived, the prizes were awarded: BYO proudly presents the winners of our sixth annual Gonzo Label Contest.

For a few months every year, our office becomes the epicenter of the homebrew universe. That's how it feels, anyway. Every day, the UPS man arrives with boxes and the mailbox is crammed with envelopes. While these Label Contest entries may not exactly come from far-flung galaxies, they definitely represent the reaches of our own homebrew planet!

As always, our sixth annual competition of creativity and wit drew an impressive response. Hundreds of homebrewers from 32 states, not to mention Sweden and the Marshall Islands, submitted their finest creations. The UPS guy thought for sure we were getting free beer, especially when he found us hovering over a table strewn with beer bottles, arguing the merits of humor versus actual artistic talent.

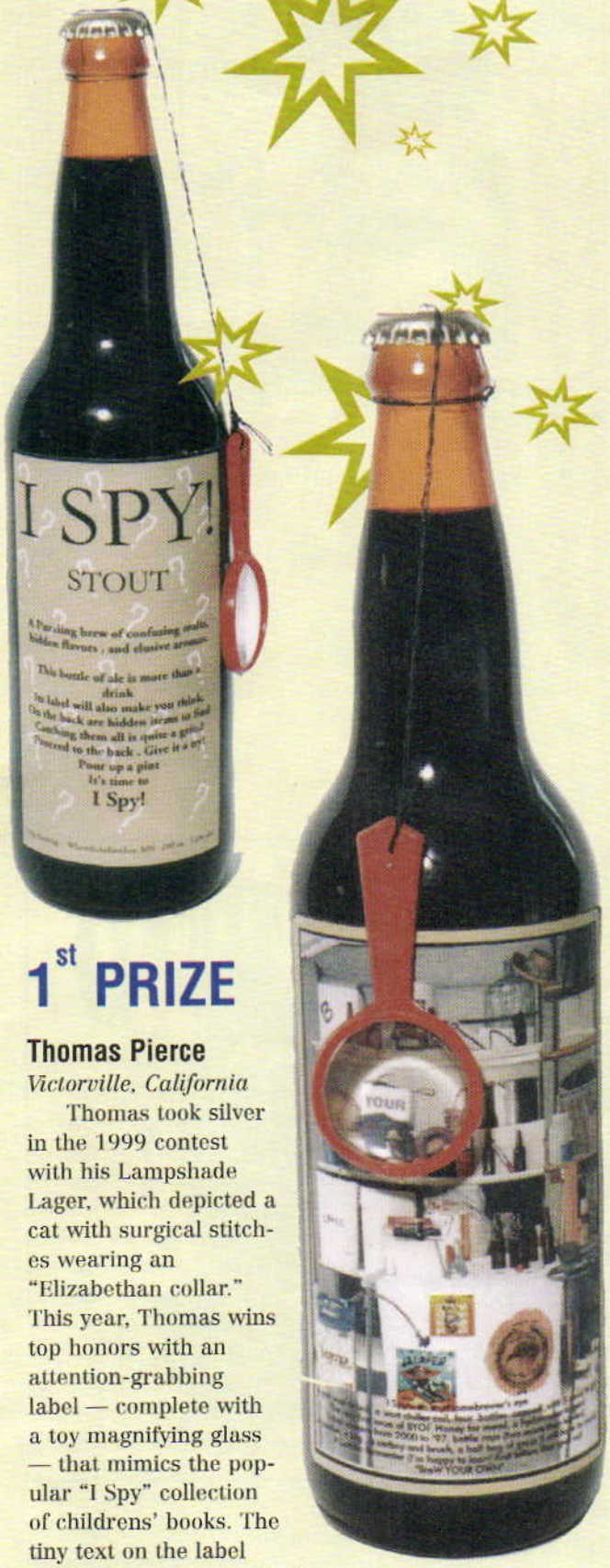
The packages contained a plethora of colorful labels. We saw the usual line-up of animals — both domestic and wild — and the familiar baby-theme creations, like "Diaper Pale Ale." We also received an unusual array of bottles bedecked with odd accessories, including tiny shells, a rabbit's foot, a ceramic red-hot chili pepper and a toy magnifying glass.

Judging the contest is no easy task. Our guidelines are surpassingly strict: Basically, we argue for a few hours until we settle on a compromise. Some of you seem to feel our choices are arbitrary. Nonsense! They are merely whimsical.

We do have one helpful hint for the legions of label *artistes* who are fond of depicting bare-naked ladies in compromising positions. In a word, that advice is "no." Hey, this is a family magazine. Isn't it?

Without further ado, we present the winners of our Sixth Annual Label Contest. Here's to fine art!

aMatEurs



1st PRIZE

Thomas Pierce

Victorville, California

Thomas took silver in the 1999 contest with his Lampshade Lager, which depicted a cat with surgical stitches wearing an "Elizabethan collar." This year, Thomas wins top honors with an attention-grabbing label — complete with a toy magnifying glass — that mimics the popular "I Spy" collection of childrens' books. The tiny text on the label challenges readers to find items such as a wort chiller, a brew kettle and a hydrometer. We were mesmerized.

Prize: "Science of Brewing" CD-ROM from American Brewer's Guild.

2nd PRIZE

Brian Janes

Sparks, Nevada

Brian's Dirty Dog Cherry Porter label appealed to the judges in several ways. The colors are offbeat, the design is slick and the begging dogs ... well, they're kind of cute.

Prize: Affordable Conical Fermenter from Hobby Beverage Equipment.

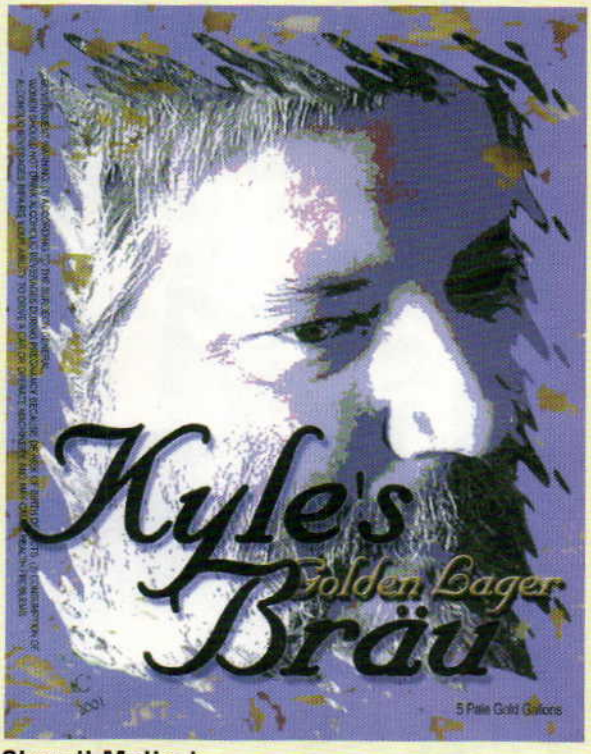
3rd PRIZE

W. Mark Richards

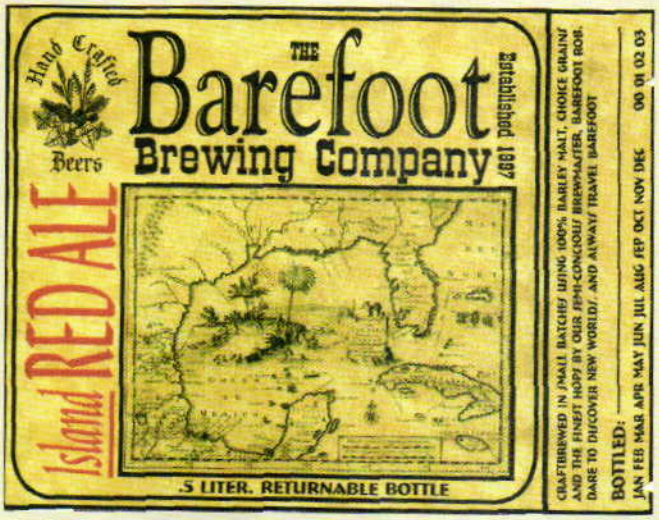
Columbus, Ohio

Mark submitted a variety of unique labels that combined hand drawings with computer art and we struggled to choose among them. We finally settled on "Sister Teresa's Diesel Power India Pale Ale." Though rendered in simple black and white, the intricate design makes a bold impression.

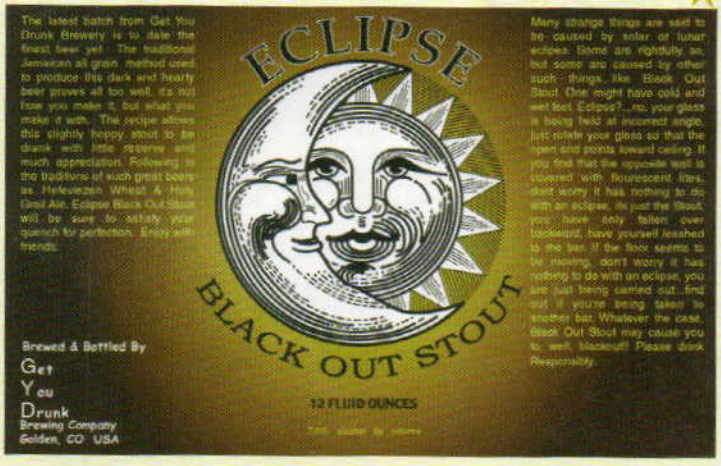
Prize: Gift Certificate from Brewsource.



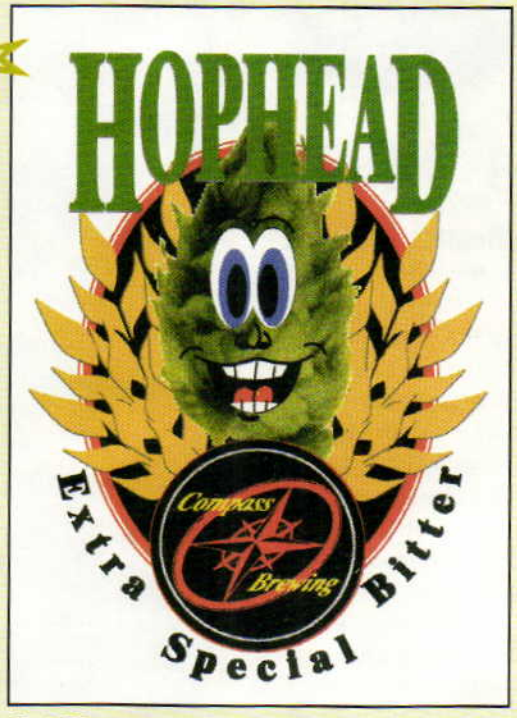
Cheryll Malisch
Clatskanie, Oregon
Prize: Gift Certificate from Beer and Wine Hobby.



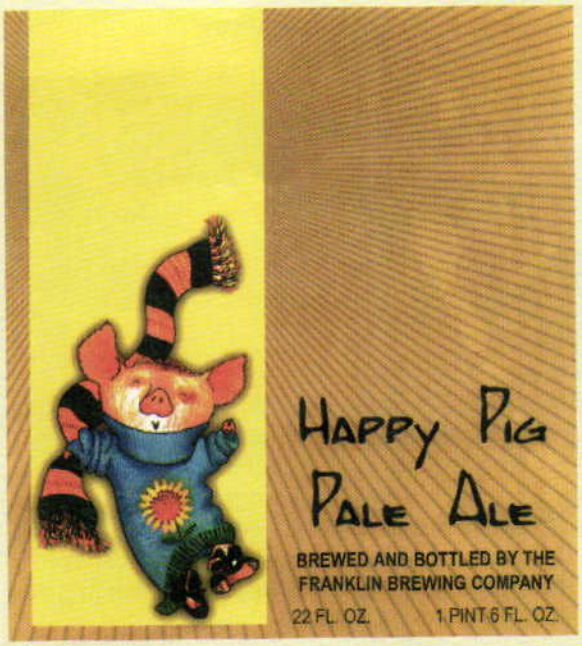
Rob Perouty
Waldorf, Maryland
Prize: Selection Luna-Rossa Wine Kit from Brew King.



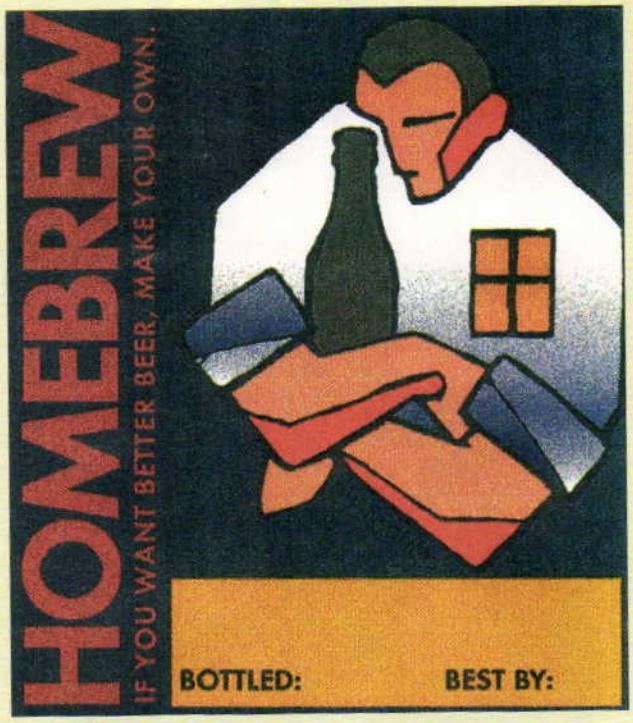
Michael G. Hall
Golden, Colorado
Prize: Party Pig Activation Pump and Filling Support Stand from Quoin Industrial.



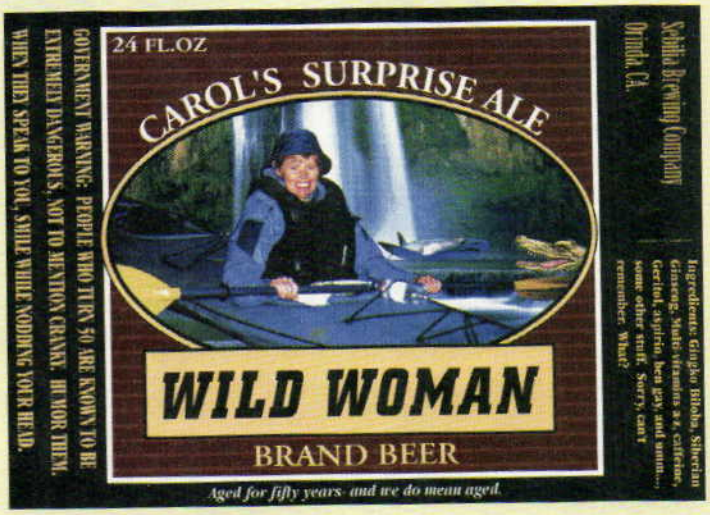
Pat Ebert
Vancouver, Washington
Prize: 23-Liter Sterile Juice Wine Kit from Mosti Mondiale.



Mark A. Wedge
Fort Worth, Texas
Prize: Gift Certificate from Beer and Wine Hobby.



Rob Hanson
Washington, DC
Prize: "Clonebrews" by Tess and Mark Szamatulski.

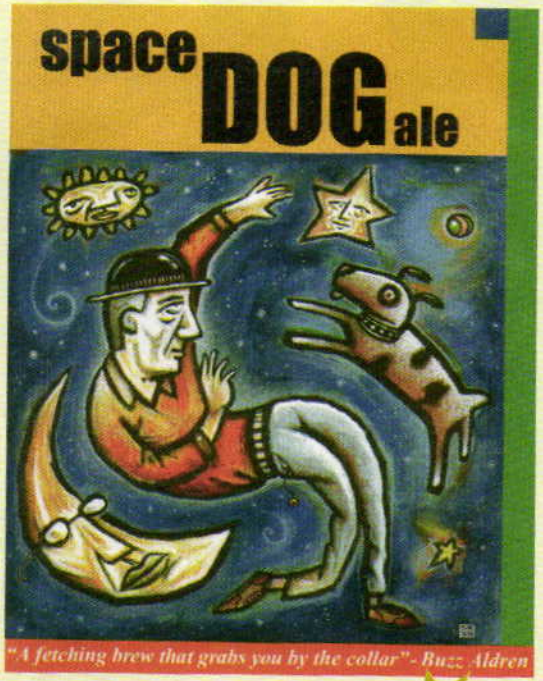


Lou Pappalardo
Oakland, California
Prize: Yeast from Wyeast.

Jere Cox
Hydesville, California
Prize: 23-Liter Sterile Juice Wine Kit from Mosti Mondiale.

PrOfESSioNalS

THE PROFESSIONALS: THE TOP THREE

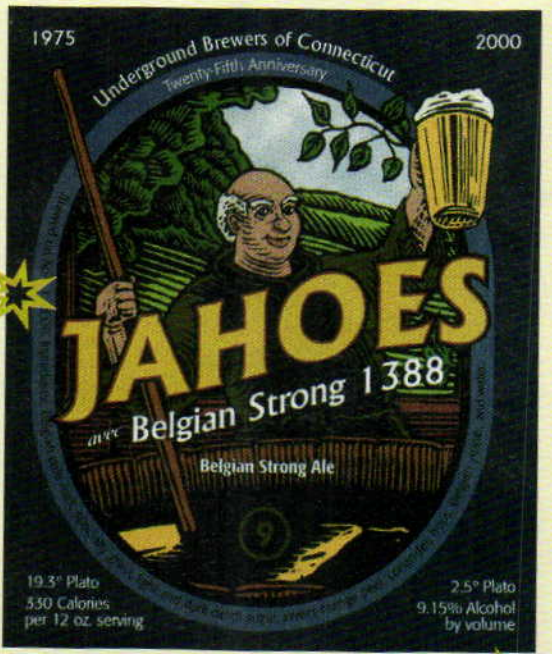


1st PRIZE

Barry Fitzgerald
Lawrence, Kansas

Barry Fitzgerald is a regular contributor to the label contest, and his Cat Hat Ale entry won honorable mention last year. Barry is a freelance illustrator and an associate professor at Kansas University. This year's entry, Space Dog Ale, grabbed all of us by the collar with its bright colors and Dali-esque, dream-like design. Or maybe we're just suckers for puppies: The space dog looks just like the canine in Brian Janes' second-prize amateur Dirty Dog label.

Prize: BrewTek Complete Yeast Culturing Kit from Brewer's Resource.



2nd PRIZE

Phil Simpson
Southbury, Connecticut

Jahoes Belgian Strong Ale was created for Phil's brewing club, The Underground Brewers of Connecticut — also known as the YAHOOS (Yankee Association of Homebrewers Objecting to Organized Societies). The club just celebrated its 25th anniversary with 15 gallons of homebrewed strong Belgian ale. The word "Jahoes" is the way Yahoos would be spelled phonetically in French — one of the languages of Belgium.

Prize: Counterpressure Bottle Filler and Tubing Kit from Brew by You.

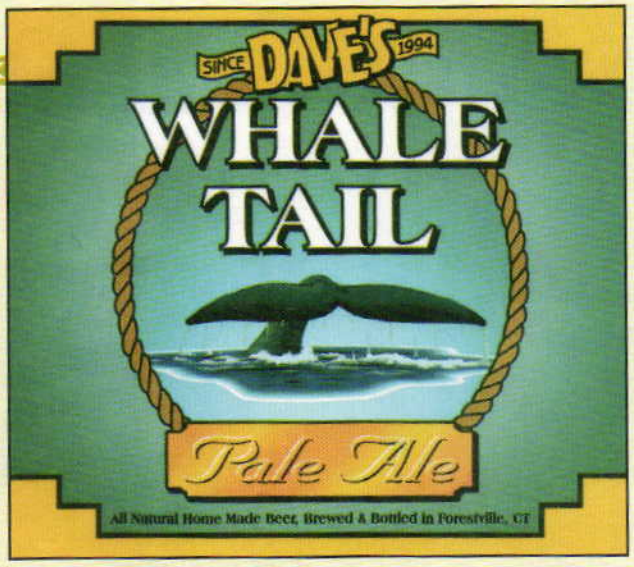
3rd PRIZE

Wray Bassett
Dover, Pennsylvania

Wray's Cherry Bomb label was a big hit. An electronic illustrator by trade, Wray laments that he never gets to design anything for his customers that's as fun (or as cool) as his homebrew labels. He missed the entry deadline for last year's contest but made up for it this year. His Cherry Bomb Stout, a dry stout with a hint of cherry added before kegging, was brewed for a St. Patrick's Day party. Next time send a full bottle, Wray!

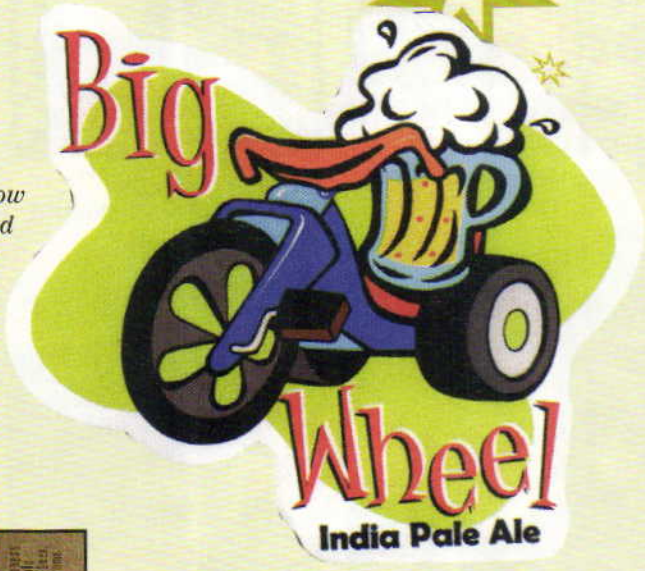
Prize: Immersion Wort Chiller from the Beverage People.

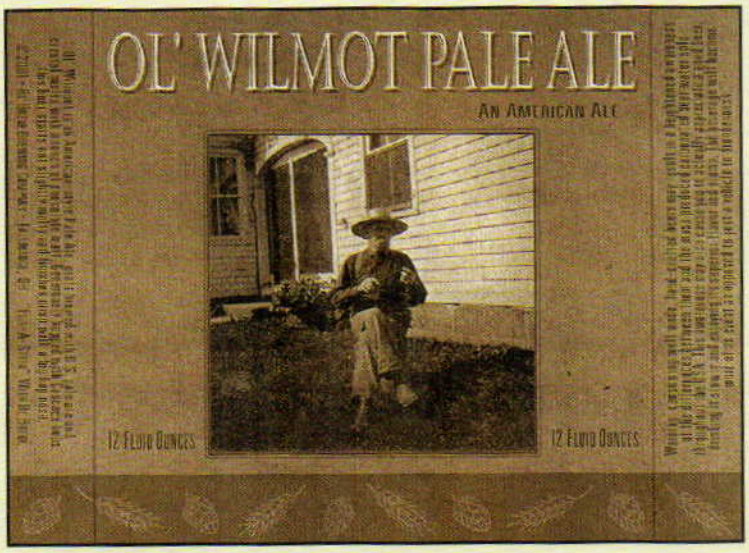
Scott and Jeff Nichols
Pleasant Prairie, Wisconsin
Prize: Gift Certificate from Homebrew Adventures.



David Levesque
Forestville, Connecticut
Prize: Gift Certificate from Maltose Express.

Darnell Kutscheid
Minneapolis, Minnesota
Prize: 50-pound bag of two-row brewers' malt from Briess and the book "Beer Captured" by Tess and Mark Szamatulski.

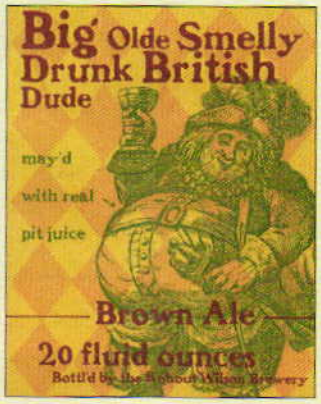




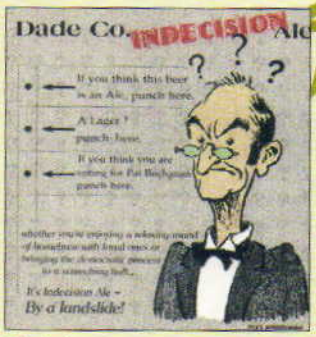
Jon Gertz
Tallmadge, Ohio
Prize: Island Mist Green Apple Riesling Wine Kit from Brew King.

EditOR's chOicE

Robert Kratochwill
Baldwinsville, New York



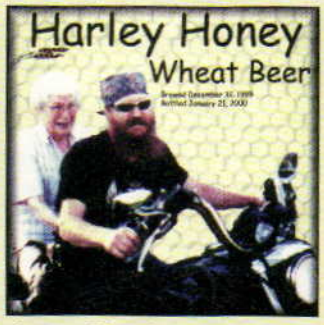
Johnny Wilson
Minneapolis, Minnesota



Rick Saylor
Bellefontaine, Ohio

Christian Thoreson
Rising Fawn, Georgia

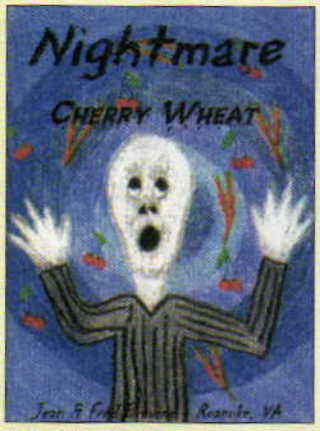
Mara Callahan
Somerville, Massachusetts



James Girard
De Smet, South Dakota

Kent Michaelsen
Hampstead, New Hampshire

Blake Clodfelter
Beaverton, Oregon



Jean Donaldson
Roanoke, Virginia

Dave Manley
Waconia, Minnesota

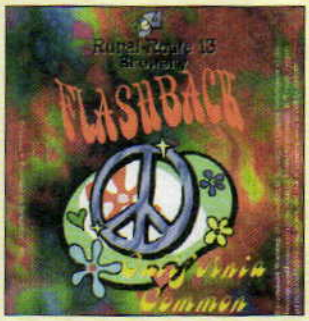
Donna Munger
Overland Park, Kansas

Greg Tobin
Huntington Beach, California

Henry Dluzak
Glendale, Wisconsin

Stephen M. Dobbins
Louisville, Kentucky

O. Rousek
Olmstead, Ohio



Gary Shewchuck
Brighton, Michigan

EDITOR'S CHOICE: THE BEST OF THE REST

Jim Whitingham
San Dimas, California

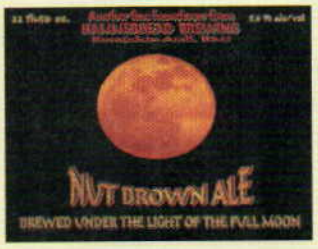
Chris Molseed
Lynchburg, Virginia

Ken Sentell
Sollentona, Sweden

Christopher Baas
Midland Park, New Jersey

Carmelo A. Lisciotto
Blue Island, Illinois

John DiGiorgio
Hicksville, New York



Jim Stepchew
Kwajalein, Marshall Islands

Glen Nichols
Fenton, Michigan

Brian and Dennis Tevlin
East Hampton, CT

Jay Hodshon
Mt. Laurel, New Jersey

Phillip Rosanski
Franklin, Wisconsin

Kent Brown
Memphis, Tennessee

Mitch Richeal
Libby, Montana

Chris Witbeck
Washoe Valley, Nevada

Eric Kasten
Baltimore, Maryland

MAKE ME

FOR CENTURIES, brewing was a seasonal activity. Beer was brewed in the colder months and stored in caves. But the fermenters were empty throughout the summer because brewers could not control their fermentation temperatures. For many homebrewers, brewing is still a seasonal activity — for the same reason. It doesn't have to be! I live in Texas, but I brew year-round.

There are two main problems with brewing in hot weather: maintaining cool fermentation temperatures and cooling the wort adequately after the boil. If the temperature in your brewing area is too warm — for example, if you don't have air conditioning — you are limited to brewing only ales, or certain kinds of ales. That's because high-temperature fermentations lead to fruity-smelling beers. These beers may also have high levels of fusel oils, alcohols with more carbon atoms than ethanol. There's no escape from having to control the temperature of your wort, but there are many alternatives to help the summer brewer do just that.

How to cool your wort

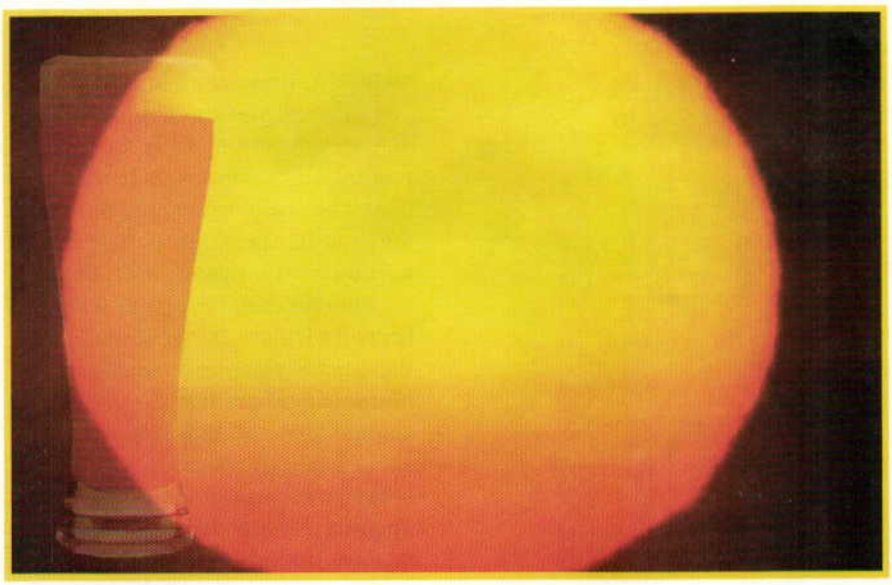
For all-grain brewers, or extract brewers who boil their entire wort, wort cooling can be a problem in hot weather. The tap water you use to cool the wort may be warmer than in the winter, and it may not be cold enough to get the wort down to pitching temperature. Generally, you can only cool your wort to about 10° F degrees above the temperature of your tap water. If the wort is too hot, the yeast can be stunted or killed. For most ale yeasts, the wort should be — at a minimum — below 90° F. And it's much better if the wort is cooled to fermentation temperatures.

Homebrewers have a variety of methods to cool their worts. Some immerse their kettle in a large amount of water, while other brewers use a wort chiller. In all cases, the temperature of the water affects how quickly the wort is chilled and the coolest temperature it can reach.

Homebrewers also have different target temperatures for their worts. Some brewers want to pitch the yeast at the same temperature as fermentation (*see page 45*). Other brewers pitch their yeast when the wort is warmer. Their idea is to get the fermentation started quickly, then slowly cool the wort to fermentation temperatures.

If you cool your wort in the bathtub, adding ice to the tub will suffice. If you use a wort chiller, you need to cool the water before it enters the chiller. The easiest way to do this is with a "pre-chiller," a submersible wort chiller that lies between your water source and regular chiller. The pre-chiller is placed in an ice-water bath to cool the water as it flows through *(see page 44 for a diagram)*.

If you use a submersible wort chiller, add ice to the pre-chiller reservoir after the wort has cooled for 5 to 10 minutes. In the initial stages of cooling, the difference in temperature between the wort and tap water will be great. Consequently, the ini-



tial cooling will be rapid. Adding ice early does little except melt the ice.

When using a submersible chiller, occasionally swirling the chiller around to create a slow whirlpool greatly increases the rate at which the wort is cooled. In a whirlpool, the hot wort flows by the copper tubing. Without a whirlpool, the area immediately around the copper coils cools quickly but the rest of wort cools more slowly. Be careful not to splash the wort when swirling. This can cause hot-side aeration. Hot-side aeration is introduction of air into wort when it is above 86° F, and it causes beer to go stale quickly. Swirl slowly and stop once the wort is moving. Wait 5 to 10 minutes before repeating.

If you use a counter-flow chiller, you will need to keep the pre-chiller iced the entire time the wort is siphoning. The slower you run the wort through, the more opportunity it has to cool down.

Control fermentation

Keeping fermentation temperatures low throughout fermentation is tougher than cooling your wort. However, there are a variety of ways brewers can deal with it.

Ales are usually fermented between 68° and 72° F. Lagers require colder fermentation temperatures, usually between 45° and 55° F. Above these temperatures, yeast will give off unwanted by-products such as esters and fusel oils.

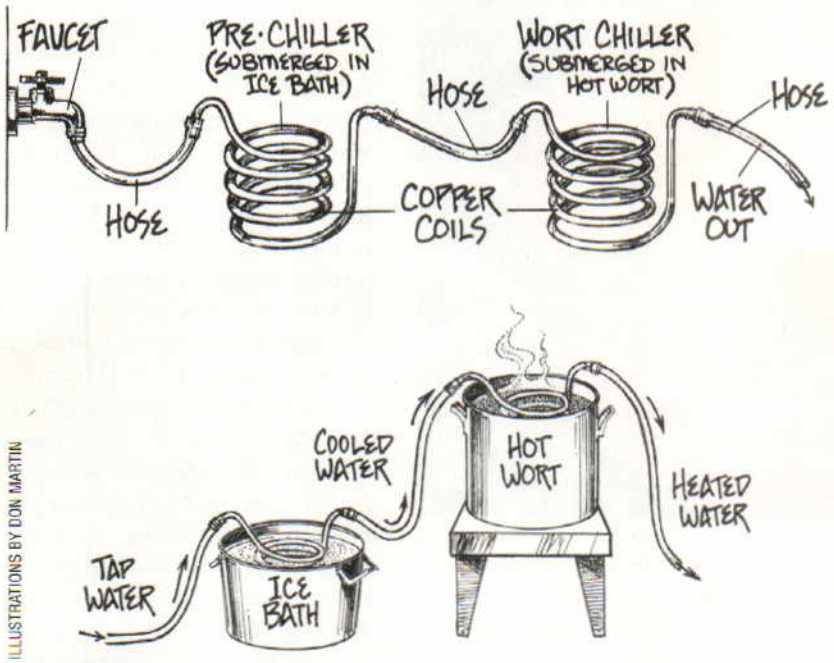
Esters lend a fruity smell to beer. In moderation, these molecules are an important part of the profile of some beer styles. IPA is an example of this. In excess, esters become overwhelming. Beers fermented too warm can have a distinctive banana smell that most beer drinkers find objectionable.

Fusel oils are alcohol molecules with more carbon atoms than ethanol, the primary alcohol in beer. At low levels, they are accepted in certain styles of beer, such as barleywines or other high-gravity brews. However, they are usually considered objectionable in most styles of beer.

YOU DON'T have to quit brewing when the weather gets hot. Cool tips, recommended yeast strains and a surefire recipe for summertime brew sessions.

SWEAT

BY CHRIS COLBY



ILLUSTRATIONS BY DON MARTIN

You can use a "pre-chiller" to cool your tap water. A pre-chiller is a copper wort chiller submerged in an ice-water bath. Water runs from your faucet through the pre-chiller before entering your regular wort chiller.

High-tech fermenters

If you are willing to spend some money on your fermentation equipment, starting at around $800 for a 7-gallon brewery, you can buy fermenters with built-in cooling equipment. A few different homebrew outlets, such as www.morebeer.com, sell small cylindro-conical (CC) fermenters (7 gallons and up) with built-in cooling options. They are round (cylindrical) at the top and taper to a point (conical) at the bottom. Yeast and trub can be drawn off the bottom, so you don't need to rack to secondary. These fermenters have cooling jackets, many filled with glycol, that circulate cold liquid through the walls of the fermenter. With a CC fermenter, you can brew any style of beer in warm weather, including lagers. In some models you can even program the temperature to change over time. For example, you may want to perform a diacetyl rest at the end of your fermentation.

The big brewing fridge

Another way to keep your wort cool is to use a refrigerator. A full-size fridge will have enough room for two 5- to 7-gallon carboys or 4 to 6 Corny kegs, which can double as fermenters.

You will need an external thermostat to control the temperature inside the fridge. In most fridges, the warmest temperature setting, typically in the mid-forties, is too cold for most beer. An external thermostat bypasses the refrigerator's internal thermostat and allows the fridge to reach ale temperatures. All you do is plug the fridge into the thermostat, and the thermostat into the wall outlet. When the temperature inside the fridge is too high, the external thermostat turns on the power to the fridge. When the temperature inside the fridge has dropped below your set-point, the external thermostat cuts the power to the fridge. Thermostats such as this are available at most homebrew shops; they cost between $50 and $100. Tape the temperature probe to the side of the carboy so you are reading the temperature of the carboy instead of the ambient temperature inside the fridge.

Adhesive temperature strips, similar to those used in aquariums, can also tell you the temperature of your fermenting beer. Since fermentations generate their own heat, the temperature of your wort may not be the same as the temperature set on your controller.

One potential problem with brewing fridges is "suck-back." If the wort is warmer than the inside of the fridge, the liquid in a U-shaped fermentation lock gets sucked into the beer. To prevent suck-back, put the minimum amount of water in the lock or remove the fermentation lock when wort is cooling. Cover the carboy opening with aluminum foil until the temperature has stabilized, then replace the fermentation lock.

The dorm fridge

If you have an old dorm fridge from your college days, you can turn it into a fermentation fridge. As with a full-sized fridge, you will need an external thermostat. You also will need to build an extension. Basically, you will place the carboy in front of the fridge and the box will surround it. You can build a wooden frame and make the sides out of insulation. Or you can duct-tape a thick cardboard box to the fridge and insulate it with old towels *(see page 46)*.

With a dorm fridge, you can easily maintain ale temperatures in hot weather. However, trying to brew lagers may put too much stress on your condenser.

The T-shirt method

If you don't have room for a brewing fridge, there is a low-tech option: If you place a wet T-shirt over the fermenter, it will cool down the wort. The wet T-shirt method works because as water evaporates from the T-shirt, heat goes with it. To keep the T-shirt wet, set a pan of water next to the fermenter and dip part of the shirt in the water. As water evaporates from the shirt, water from the glass will wick up to replace it.

You can increase the cooling

power of the T-shirt method by pointing a fan at the fermenter or adding ice to the water pan. You also can split the wort in your 5-gallon carboy into two smaller carboys. This increases the amount of surface area (the wet T-shirt) per unit of wort volume.

The T-shirt method is cheap, but only moderately effective. You can decrease the temperature of your wort by 5 to 15° F, depending on a number of factors. These factors include the temperature of the water in the pan, relative humidity, and the surface-to-volume ratio of your fermenters. You can help yourself out by cooling your wort all the way down to fermentation temperatures and placing the fermenter in the coolest part of your house.

Too hot? Brew anyway.

When I was a graduate student, I lived in an apartment without air-conditioning. And I didn't have the money to buy a brewing fridge. I was often brewing when the temperature in my room was up to 80° F. (Above 80° F, I figured it would be too risky to brew; I didn't want to be drinking too many fusel oils.)

If you are stuck brewing at the upper end of the ale range, or even slightly beyond, there are a few things you can do to compensate for the higher temperatures. In addition, you can choose appropriate styles to brew, so that the effects of high temperature brewing are less at odds with the style parameters.

At higher temperatures, yeasts produce more esters, but there are other variables that influence ester levels. These variables include the yeast strain, amount of yeast pitched, wort gravity and level of aeration. By controlling these variables, you can partially counteract the effect of high-fermentation temperature and brew ales at temperatures in the high 70s.

Some yeast strains produce fewer esters. These are usually described as "clean." Yeasts that produce many esters are labeled as fruity. If you are brewing at high

HIGH-TEMP YEAST STRAINS

The commonly-cited upper temperature limit for most ale yeasts is 72° Fahrenheit. However, some ale yeast strains perform well at temperatures above this limit.

In general, Belgian yeasts and wheat-beer yeasts are good high-temperature fermenters. And some esters are expected in these beer styles. "When temperatures increase above 78° F, a significant increase in fusel alcohols is likely for most yeast," says Dave Logsdon of Wyeast. "But Belgian yeast, wheat beer yeast and wine yeast appear to have lower levels of fusels when fermented at the higher temperature range."

Some "normal" ale yeast strains also work well above 72° F. "California Ale (WLP001) is the best high-temperature yeast we have," says Chris White, owner and founder of White Labs. "With this strain, neutral character can be obtained even up to 80° F. And East Coast Ale Yeast (WLP008) is used by one brewery in Taiwan that consistently ferments at 90° F, and they report good beer flavor."

Here are some strains that Logsdon and White recommend for high-temperature brewing:

"Normal" ale yeast strains
White Labs WLP001 (California Ale)
White Labs WLP008 (East Coast Ale)
Wyeast 1099 (Whitbread Ale)
Wyeast 1332 (Northwest Ale)
Wyeast 1335 (British Ale II)

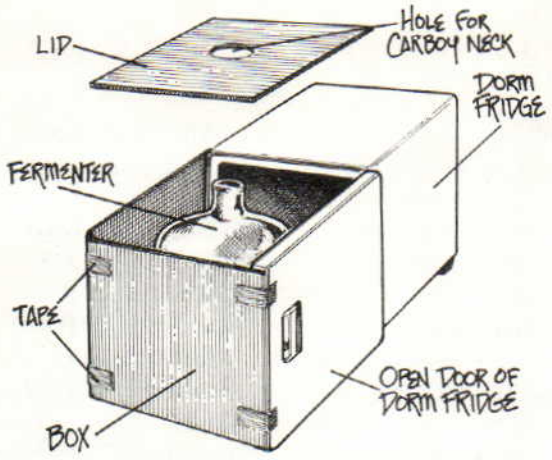
Belgian yeasts
White Labs WLP500 (Trappist Ale)
White Labs WLP550 (Belgian Ale)
White Labs WLP565 (Belgian Saison)
Wyeast 1214 (Belgian Ale)
Wyeast 1388 (Belgian Strong Ale)
Wyeast 1762 (Belgian Abbey II)
Wyeast 3787 (Trappist High-Gravity Ale)

Wheat-beer yeasts
White Labs WLP300 (Hefeweizen)
White Labs WLP380 (Hefeweizen IV)
Wyeast 3068 (Weihenstephan Weizen)
Wyeast 3333 (German Wheat)
Wyeast 3638 (Bavarian Wheat)

Fermentation Temperatures

80° plus	Not recommended for most yeast strains.
75° to 80°	Even with compensating techniques, ales will be fruity with most yeast strains.
72° to 75°	Reasonably clean ales can be brewed with compensating techniques or appropriate strain.
68° to 72°	Normal ale fermentation temperature range.
60° to 68°	Some ales are fermented at these temps (Scottish ales, for example).
55° to 60°	Some high-temperature lagers brewed here.
45° to 55°	Normal lager temperature range.

(All temperatures are listed in degrees Fahrenheit)



If you have a dorm fridge, you can build an extension to hold your carboy at ale temperatures. You could make a wooden frame and use insulation for the sides and top, or try thick cardboard held with duct tape and wrapped with towels.

temps, pick a clean yeast strain *(see page 45)*. The higher temperatures may cause your clean yeast to make fruitier beer than it normally would. But, unless the temperature is excessive, you can brew a decent beer even with the extra esters.

You should likewise pitch a lot of yeast, up to one and a half times the recommended amount. For a 5-gallon batch, make a 3-liter starter in a large soda bottle. Pitch only the sediment. Essentially, you grow up the starter and throw away any esters produced in the yeast's growth phase. Thoroughly aerating your wort also lowers the amount of esters produced. Since more air dissolves in cold water than warm, this is another reason to cool your wort all the way to pitching temperature.

Finally, you can minimize ester levels by only brewing low- or medium-gravity beers in hot weather. Brewing at lower gravities limits the amount of heat your wort generates during fermentation.

With clean yeast from a big starter pitched into a well-aerated wort, you can brew a reasonably clean ale at 75° F. At temperatures between 75° and 80° F, you may end up with a moderately fruity beer even with the adjustments I've mentioned. How fruity the beer is will depend on the yeast strain; some strains can still produce a clean ale at these temperatures. Above 80° F, beer brewed with a normal ale yeast would probably be

undrinkable. However, it is still possible to brew a Belgian ale or wheat beer at these temperatures.

If you choose to brew an appropriate style of beer, one where some fruitiness is expected, the esters will be less detrimental to your beer. British ales are good candidates for warm-weather brewing, because bitters, milds and porters are expected to have a bit of fruity ester smell. Stout is also a good choice as the roasted grain can partially cover up some of the fruitiness.

One final caution when brewing at high temperatures. The wort can pick up off-flavors from the trub fairly quickly. It's best to rack the beer to secondary after 3 to 4 days. At high temperatures with lots of yeast, your primary fermentation will probably only take 2 days. ■

BYO columnist Chris Colby lives in sweltering Texas, where he brews successfully all summer long.

Hot-as-Hell Bitter

(5 gallons)
OG = 1.043 FG = 1.011
IBUs = 40

Ingredients

7 lbs. of pale ale malt *or*
5.5 lbs. of liquid malt extract (light, unhopped) *or*
4.5 lbs. of dry malt extract (light, unhopped)
3/4 lbs. crystal malt (30° to 40° Lovibond)
12 AAU East Kent Goldings hops (bittering)
1/2 oz. Fuggles hops (dry hop)
Wyeast 1272 (if fermentation temperature is 75° F) *or*
White Labs WLP001 (fermentation temp 80° F) *or*
Wyeast 1056 (fermentation temp 80° F) *or*
White Labs WLP008 (fermentation temp 85° F)

Step by step

Make 2.5 liters of yeast starter wort with 300 mL of dry malt extract. Refrigerate the starter overnight and then shake it well to aerate. Pitch the yeast starter three days before brewing. For all-grain brewers, mash grains at 152° F for 1 hour. For extract brewers, heat the brewing water to 152° F and steep the crystal malt for 30 minutes prior to boiling the water and adding the malt extract.

Boil the wort for one hour, adding the Goldings to the wort once it begins to boil. Cool the wort down to between 65° and 68° F. Aerate the wort well. Pour off the liquid from the starter and pitch the yeast sediment. Let ferment 4 days. Rack to secondary and add dry hops. Bottle after another 4 to 7 days in secondary with 2/3 cup of corn sugar. Enjoy.

BEYOND HOPS


Greek Oregano

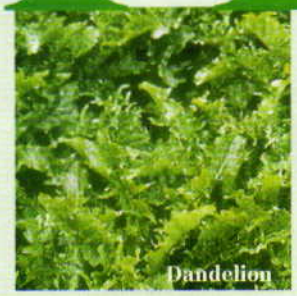

Licorice


Cinnamon


Fennel


Chile Pepper

by joe and dennis fisher


Dandelion


Basil


Chamomile


Rosemary


Lavender

From allspice to rosemary, here's how to brew with spices and herbs. Tips, recipes, resources and a handy chart.

Everyone knows about brewing with hops, but what about dandelions, licorice and ginger? What about nettle, alecost, milk thistle and juniper? All of these herbs or spices, and many more, have been used for centuries to flavor, bitter and preserve beer. Traditionally, most herbs were added to the cask after fermentation began to slow, as dry hops are today, though some were steeped in the beer just before quaffing.

Herbs and spices can be used in place of hops or in addition to them. There are bittering and flavoring herbs, just as different varieties of hops are used to add aroma, flavor and bitterness to beer.

The bitterness, flavor and aroma that herbs impart to beer may be subtly or very different from the characteristics added by hops. Which herbs and spices to add depends largely on what kind of beer you want to make. A lager with just a hint of forbidden spice? Or a huge holiday beer loaded with nutmeg and cloves? Some beer styles require a bit of herbal flavor for authenticity. Belgian Grand Cru uses coriander seed; saison can be spiced with star anise and orange peel. German weissbiers often are served with a drop of sweet woodruff extract.

Brewing herbs have different qualities and perform different functions in brewing. Most herbs traditionally used for brewing, such as dandelion, horehound and nettles, are bitter. Others provide flavor and aroma. (Spices are used exclusively for flavoring and aroma.)

BREWING HERBS AND SPICES

herbs

Name	Brewing Use	Parts Used	Amount Used (5- gallon batch)	Time in Boil
Alecost *(Chrysanthemum balsamita)*	bittering	leaves	up to 1 oz.	60 min.
Anise Hyssop *(Agastache foeniculum)*	flavoring	flowers	up to 1 oz.	15 min.
Sweet Basil *(Ocimum basilicum)*	bittering	leaves	1 to 2 oz.	steep 15 min.
Chamomile *(Chameamelum nobile)*	bittering	flowers	up to 2 oz.	45 min.
Dandelion *(Taraxacum officinale)*	bittering	leaves	1 to 2 lbs.	60 min.
Elecampane *(Inlua helenium)*	flavoring	roots	1/4 to 2 oz.	60 min.
Elderberry *(Sambucus nigra)*	flavoring	flowers/berries	1/4-2 oz/5-10 lbs.	dry hop/15 min. steep
Greek Oregano *(Origianum vulgare hirta)*	bittering	leaves	1/2 to 2 oz.	45 min.
Heather *(Calluna vulgaris)*	bittering	flowers	5 to 12 cups	90 min.
Horehound *(Marrubium vulgare)*	bittering	leaves	1/2 to 2 oz.	60 min.
Hyssop *(Hyssopus officinalis)*	flavoring	flowers	up to 1 oz.	60 min.
Juniper *(Juniperus communis)*	flavoring	leaves/berries	1 to 4 oz./1-2 Tbsp.	60 min.
Lavender *(Lavendula angustifolia)*	bittering	flowers	up to 1 oz.	45 min.
Lemon Balm *(Melissa officinalis)*	flavoring	leaves	up to 1 oz.	steep 15 min.
Milk Thistle *(Silybub marianum)*	bittering	leaves	1 to 2 oz.	45 min.
Nettle *(Urtica diocia)*	flavoring	leaves	1/2 to 1lb. fresh	60 min.
Rose Hips *(Rosa rugosa)*	flavoring	fruits	up to 1 oz.	60 min.
Rosemary *(Rosmarinus officinalis)*	flavoring	leaves	1/4 to 1.25 oz.	45 min.
Sweet Woodruff *(Galium odoratum)*	flavoring	flowers	1/4 oz.	dry hop

spices

Allspice *(Calycanthus floridus)*	flavoring	seeds	1 to 2 Tbsp.	45 min.
Cardamom *(Elettaria cardamomum)*	flavoring	seeds	up to 0.15 oz.	30 min.
Chile peppers *(Capsicum annuum)*	flavoring	pods	up to 1/4 lb. fresh	steep 15 min.
Cinnamon *(Cinamomum zeylanicum)*	flavoring	bark	1 to 4 sticks	30 min.
Cloves *(Eugenia aromatica)*	flavoring	buds	5 to 15 buds	30 min.
Coriander *(Coriandrum sativum)*	flavoring	seeds	1 to 2 oz.	15 min.
Ginger *(Zingiber officinalis)*	flavoring	roots	1 to 6 oz. fresh	15 min.
Grains of Paradise *(Aframomum melegutea)*	flavoring	seeds	up to 0.12 oz.	5 min.
Fennel *(Foeniculum vulgare)*	flavoring	seeds	up to 1/4 oz.	45 min.
Licorice *(Glycyrriza glabra)*	flavoring	roots	up to 1/2 oz.	60 min.
Nutmeg *(Myristica fragrans)*	flavoring	pods	up to 0.15 oz.	30 min.
Star Anise *(Illicium verum)*	flavoring	pods	1/4 to 1 oz.	30 min.

Photos: Licorice, Fennel, Dandelion, Chamomile and Lavender courtesy of Johnny's Selected Seeds in Albion, Maine.

How to find and buy exotic herbs

Once upon a time, finding any herb much more unusual than oregano was a trial. Things are better now, thanks to the boom in medicinal and culinary herbs.

Most common culinary herbs can be found fresh at grocery stores and farmers' markets. Others are available in bulk at health food stores. Ethnic markets sometimes carry unusual spices and herbs, and may be able to special order something they don't carry. The Internet is also a good source of information on botanicals, with thousands of Web pages devoted to the topic.

And don't forget your favorite homebrew shop: Many now carry the Brewer's Garden line of speciality herbs and spices, packaged in amounts suitable for a five-gallon batch of beer. The inventory includes juniper berries, sweet gale, grains of paradise, licorice root, dried woodruff, dried elderflowers and more. E-mail: info@brewersgarden.com.

If all else fails, here are a few good companies that sell herbs and spices by mail.

Jean's Greens
119 Sulphur Springs Road
Norway, NY 13416
(315) 845-6500
jean@jeansgreens.com

Pacific Botanicals, Inc.
4350 Fish Hatchery Road
Grants Pass, OR 97527
(541) 479-7777
www.pacificbotanicals.com

Wildweeds
233 Red Rock Lane
Fieldbrook, CA 95519
(800) 553-9453
email:info@wildweeds.com
www.wildweeds.com

Some herbs perform several functions depending on when they are added to the boil. Chamomile provides bitterness if added early, flavor if added late and aroma as a "dry hop." Ginger is usually used in its fresh form, either grated or sliced. (Dry, ground ginger has a harsh, astringent flavor when added to beer.) Small amounts of licorice root added to the boil can aid in head retention.

Generally speaking, brewing herbs fall into three different classes, depending on what part of the plant is used. Hops, lavender, chamomile, hyssop and sweet woodruff are flower herbs. Some of these express their flavors after a short steeping; others must be boiled with the wort.

Basil, horehound, nettles and alecost are leaf herbs. Leathery, spiny or tough leaves such as horehound, rosemary, juniper and spruce are usually boiled with the wort. More delicate leaves like basil and lemon balm may be steeped for 10 or 15 minutes after the boil.

Elecampane, ginger and licorice are root herbs. With the exception of ginger, root herbs are used dry, then chopped or shaved to increase their surface area and aid with flavor extraction.

Here are nine handy tips for brewing with herbs and spices.

1: The Rule of Plenty. Good fresh herbs and spices are potent! Many a beer has been rendered undrinkable by the addition of too much of a good thing. We once put what seemed like a reasonable amount of dried gentian (1/4 ounce) in a five-gallon batch and ruined it. A friend of ours used spruce essence to produce a PineSol beer! Sometimes the excess herbal potency will age out, as in the case of the pine beer and some hot chili beers we've brewed. The gentian never did. The best way to prevent a catastrophe is to start small. Use just a little of any new ingredient — especially a bittering herb! — to see how it acts in the brewpot.

2: Hop Moderately. Most recipes recommend underhopping, to avoid drowning out the sometimes-subtle essences of herbs and spices. Most of our recipes contain just about an ounce of hops.

3: Get Insider Information. Talk with others who have brewed with this ingredient and get some first-hand advice. The Web is very useful here, and brewers will often respond to respectful e-mails. Check all the recipes you can find using this herb or spice, and be skeptical, especially about amounts.

4: Don't be Afraid. A lot of people are reluctant to put anything strange in their beer, and many brewers shun any adjunct. But remember that brewing with herbs is a respectable tradition with a long history. For those of a conservative slant, why not add just a pinch of herb or spice to an otherwise familiar brew?

5: Not Too Many. When first starting to brew with herbs and spices, it's a good idea to avoid adding too many different kinds to a single batch. These ingredients sometimes make unusual contributions, and too many flavors can result in a funky potpourri. On the other hand, you may want to duplicate a successful flavor, and be unable to attribute it to a certain herb or spice.

6: Avoid Dangerous Herbs. One person's brewing herb is another's toxic alkaloid. Some traditional brewing ingredients have been found to be dangerous, at least in large amounts. While it's true that many homebrewers and even some commercial brewers are making beer from bog myrtle, wormwood, tansy and yarrow, it's safer to give these a pass, especially since many other bittering agents are available.

According to Cindy Renfrow, author of "A Sip Through Time: A Collection of Old Brewing Recipes," "some ancient beers, wines and other drinks were brewed as medicines, to be taken by the teaspoonful, not chugged by the liter."

Research is key here. If you

PUT SOME HERBS IN YOUR KETTLE

Dandelion Bitter

(five gallons, all-grain)
OG = 1.049 FG = 1.014 IBUs: n/a

Dandelion lends a sour bitterness and bright orange color to beer. Young, tender leaves can be eaten in the spring; large, old leaves are very bitter.

Ingredients

0.5 lbs. toasted malt
0.75 lbs. British crystal malt (60° Lovibond)
6 lbs. British mild ale malt
1 lb. fresh dandelion leaves
4.5 AAUs East Kent Goldings (1 oz. of 4.5% alpha acid)
3 AAUs Willamette hops (0.5 oz. of 6% alpha acid)
Whitbread Ale yeast (Wyeast 1099) or London (Wyeast 1028)
0.5 ounce Willamette hops
2/3 cup corn sugar for priming

Step by Step

Clean dandelions thoroughly in several changes of water. Mash-in grains at 155° F. Hold at 153° F for 90 minutes. Sparge with 4 gallons 180° F water, and collect 5.5 gallons runoff. Add dandelions, boil 45 minutes. Add East Kent Goldings, boil 15 minutes. Add Willamette at last 2 minutes. Pitch yeast when cool. Ferment at ale temperatures (65° to 70° F). When fermentation slows, add Willamette dry hops. Bottle at completion with priming sugar.

Extract Option

0.5 lbs. pale malt
0.5 lbs. British crystal malt (60° Lovibond)
3.75 lbs. Coopers Bitter Kit
2 lbs. Muntons light DME

Toast pale malt in a 350° F oven for 10 minutes. Add grains to one gallon of 160° F water. Hold at 150° F for 30 minutes. Strain out grains and sparge with 1/2 gallon of 180° F water. Add extracts and proceed with boil as in all-grain recipe. Cool wort, pour into fermenter, top up to 5 gallons. Pitch yeast when cool. Ferment at ale temperatures (65° to 70° F).

Horehound Brown Ale

(five gallons, all-grain)
OG = 1.048 FG = 1.007 IBUs = n/a

Horehound contains very bitter compounds and should be used sparingly, but it imparts a delicious flavor to some English ales.

Ingredients

1 lb. British crystal malt (60° Lovibond)
0.5 lbs. chocolate malt
0.3 lbs. black patent malt
1.5 lbs. Munich malt
5.5 lbs. British mild ale malt
1/2 cup molasses
2 oz. fresh horehound leaves (or 1 oz. dry)
1 oz. fresh grated ginger root
4.5 AAUs East Kent Goldings hops (1 oz. of 4.5% alpha acid)
London ESB yeast (Wyeast 1968)
2/3 cup corn sugar for priming

Step by Step

Mash-in grains at 155° F. Stabilize at 153° F and hold for 90 minutes. Sparge with 4 gallons 180° F water and collect 5.5 gallons runoff. Add molasses, horehound and ginger, boil 45 minutes. Add East Kent Goldings. Boil 15 minutes. Pitch yeast when cool. Ferment at ale temperatures (65° to 70° F). Bottle at completion with priming sugar.

Extract Option

0.5 lbs. chocolate malt
0.25 lbs. black patent malt
0.5 lb. British crystal malt (60° Lovibond)
4 lbs. Mahogany Coast Nut Brown Ale kit
2 lbs. Muntons dark DME

Add grains to 1 gallon of 160° F water. Hold at 150° F for 30 minutes. Strain out grains and sparge with 1/2 gallon of 180° F water. Add extracts and molasses and proceed with boil as in all-grain recipe. Cool wort, pour into fermenter, top up to 5 gallons. Pitch yeast when cool. Ferment at ale temperatures (65° to 70° F).

Brunswick Mumm

OG = 1.066 FG = 1.012 IBUs = 31

Mumm is an ale style dating from the 15th century. It tastes like the soda pop Moxie: faintly medicinal with a light peppery sweetness. Flaked rye, wheat flakes and quick-cooking oats can be substituted for the malts.

Ingredients

5 lbs. Klages malt
1.5 lbs. British crystal malt (60° Lovibond)
3 lbs. rye malt
2 lbs. wheat malt
2 lbs. steel-cut oats
0.5 lbs. roasted barley
0.3 lbs. black patent malt
0.3 lbs. chocolate malt
7.5 AAUs Northern Brewer hops (1 oz. of 7.5 % alpha acid)
Any 6 of the following:
- 2 tablespoons juniper berries
- 0.5 oz. spruce tips
- 0.5 oz. dried chamomile
- 0.5 oz. dried rose hips
- 0.25 oz. lavender flowers
- 0.25 oz. elderflowers
- 0.25 oz. elecampane root
- 1 to 4 licorice roots
- 1 Tbsp. fennel seed

Weihenstephan wheat yeast (Wyeast 3068)
2/3 cup corn sugar for priming

Step by Step

Mash-in grains with 3-1/5 gallons 148° F water and hold for 2 hours. Sparge with 4 gallons of 170° F water and collect 5 gallons runoff. Add Northern Brewer and spices, boil 60 minutes. Pitch yeast when cool. Ferment at ale temperatures (65° to 70° F). Bottle at completion with priming sugar.

want to experiment with historical brewing ingredients, use small amounts and learn the risks first. Surf the Net, consult with herbalists or even talk to a doctor. Many of the herbs used in traditional brewing, such as sassafras, wormwood and mugwort, have been banned by the FDA for internal use.

7: Fresh vs Dry. Fresh and dried brewing herbs make different contributions to beer. When formulating recipes, remember that dried herbs contain far less water than fresh ones, so their flavors and essential oils should be more concentrated. Less dried herbs will be needed to achieve similar effects.

Many herbs deteriorate with age or poor storage, so use the freshest you can get. Yes, you can use some of that stuff labeled "rosemary" that's been lurking in the back of the spice drawer for the past decade, but the results could be uncertain.

8: Dry Hop with Herbs. Some of the more delicate aromatic herbs can be added to the secondary fermenter in the same way as dry hops. Rosemary, sweet woodruff, heather and elderflower are all good candidates for this technique. A few sprigs added to the carboy a week or two before bottling will contribute an herbal aroma to the beer. Loose dry herbs should be contained in a hop bag.

9: Make Some Tea: One way to control the bitterness of herbal beer is to first make an herbal "tea." Winnipeg homebrewer Sean Richens reports that this technique works well with buckbean, an historic bittering agent with edible roots. "It was a perfectly reasonable brown ale," he says. "You couldn't tell it was brewed with buckbean. But what I noticed was the spectacular clarity; I've never seen any homebrew that bright!" Here is his recipe for a 1.2-gallon batch.

Buckbean Brown Ale

1 oz. dry buckbean leaves
2.5 oz. crystal malt
1 oz. roasted barley
1.8 lb. Briess pale malt syrup
1 tsp. gypsum
1 Tbsp. Irish moss

Add buckbean leaves to 1 pint water. Boil 2 to 3 minutes, discard the water. Add 1 pint more water, boil 1 hour, strain out leaves, cool and measure volume. Steep malts in 1 gallon water at 153° F for 30 minutes. Add extract, gypsum and Irish moss. Boil 30 minutes.

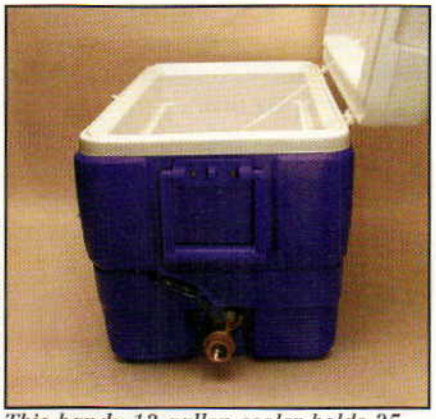
While boiling add half of the herb extract, cool a sample, and taste. Add more of the extract to taste. Cool and pitch. After 14 days fermentation, rack beer. Age 2 months and bottle. ■

Joe and Dennis Fisher are the authors of "The Homebrewer's Garden" (Storey Books, 1998).

Think Big

Build a mash tun to brew big beers like barleywine

by Thom Cannell



PHOTOS BY THOM CANNELL

This handy 12-gallon cooler holds 25 pounds of grain during the mash.

IT'S ALL BYO'S FAULT, REALLY. Those intriguing stories on great big doppelbocks, Imperial stouts and barleywines really got to me. Though I dearly love the sleek line of the cylindrical mash tun I built a few years ago *("Build A Mash Tun For $50," September 1999)*, it just won't do for big beers. Let's face it — if you want to brew big beers, you need a big mash tun.

After stuffing fourteen pounds of grain into a five-gallon cooler — with a half gallon of foundation water — you will quickly run out of room for sufficient mash water. If you want to do a two-temperature mash, you have to stay below ten pounds to be safe. And for a ten-gallon brew? Forget it.

The answer to the problem is quite obvious — build a bigger mash tun, one with more room, modest cost and some cool new features. No problem! My new mash tun design costs under $80 and is even easier to build than the last one. Not only is it bigger, but I have discovered some interesting ways to discourage stuck mashes.

I followed the lead of several ten-gallon homebrewers I've brewed with; they use large chest coolers for mash tuns. A local warehouse club had 50-quart (12-gallon) Igloo coolers for $20. It had only one shortcoming: the pre-drilled outlet was 3/4 inch. This meant I had to use 3/4-inch hardware, which is more expensive. The chest is 12 inches tall inside, and the bottom is 19 inches by 10 inches. That means it should be able to hold about 20 to 25 pounds of grain with sufficient mash water (1 pound of grain to 1 quart water). Igloo promises that its two inches of insulation will "keep ice for five days in 90° F temperatures." It seems to me, it would hold a steady mash temperature for at least an hour or two!

Making My Mash Tun

The first step was to remove the built-in hose inlet-drain of the cooler. The next step was constructing what is called a "bulkhead fitting," which replaces the plastic inlet-drain with a solid metal construction. The bulkhead fitting consists of a short pipe penetrating the wall of the cooler (I used the predrilled hole) with a waterproof gasket on the inside and a nut or other fitting at either end of the pipe.

Inside, I chose an O-ring for a gasket because I have plenty of them left over from other projects. (Just be sure that the O-ring is food grade, not industrial, or else there is a small risk of some rubber flavors entering your beer.) The threaded pipe (brass or stainless) must be long enough to go through the cooler wall and leave a minimum of five threads at either end for attaching fittings. The pipe I used is 1-1/2 inches long. On the outside is an enormous 3/4-inch brass valve.

On the inside, there's the gasket, followed by a 3/4-inch brass T with 1/2 by 1/2-inch inlets. I picked this because I ordered 1/2-inch Kynar barbed fittings from Moving Brews (www.movingbrews.com), the only provider I know of with these high-temperature, everything-proof connectors. I selected Kynar over nylon for its resistance to heat; it is actually rated for autoclave (a sterilization apparatus which uses steam and pressure, most commonly used to sterilize medical instruments). The inlet size of these barb fittings (1/2 inch) was determined by the cool new feature of our mash tun: the stainless-steel flex pipe that serves as a drain manifold.

Every mash tun requires a method of running the wort out and leaving the grains behind. Most mash tuns made from ice chests use a large rectangular manifold made from copper or CPVC plastic. The tubes are sawed deeply and the slits form the filter. I saw a better alternative when I realized that

SHOPPING LIST

Igloo 50-quart (12-gallon) cooler	$20.00
3/4-inch ball valve	$11.50
3/4 by 1-1/2 inch brass nipple	$2.25
3/4 by 1/2 by 1/2 inch brass T	$18.00
2-1/2-inch Kynar barb fittings	$6.00
60-inch stainless-steel flex tube	$12.00
2 clamps (stainless, Oeticker)	$1.00
20-inch wide copper window screen	$6.00
1/2-inch heat shrink tube	$2.00
3/4-inch O-ring	$0.50

The parts required to put together our 3/4-inch bulkhead (O-ring not shown).

Fit together, the bulkhead still requires cutting and installing flex and O-ring.

stainless-steel flex pipe might be sturdy enough to resist crushing forces from even the biggest grain load I could imagine. Its entire length could serve as the filter, since its entire circumference is porous. You'll find various sizes and lengths of stainless-steel flex hose in the plumbing section of any hardware store. This is the same material we used a while back in "Four $5 Filters" *(March 2001)*.

The only tricky part is to secure the flex to the T; hence the barbed fittings. The flex from a standard washing machine or dishwasher (48 to 72 inches) should form a great manifold, with one potential problem. To suck up as much sweet wort as possible, the manifold has to be under the liquid level. And your T might sit quite high off the floor of your new mash tun. If that happens, there is a very handy solution — heat shrink tubing.

This product of the electronic industry could be tightly fit to 4 to 6 inches of the flex connection to make it "solid." The solid pipe would angle down to the floor of the mash tun and a slight tilt of the whole cooler would bring nearly every drop of wort to your kettle.

My preference for securing the flex to the Kynar fittings (if necessary) is Oeticker clamps or "snapper" clamps from St. Patricks of Texas (www.stpats.com). Regular stainless-steel clamps use stainless steel only in the constricting band; the other parts rust.

Success Report

I unscrewed the supplied bulkhead drain fitting and tightened the brass version. Keeping the T-fitting horizontal was actually no problem and attaching the Kynar barbs to the T took thirty seconds. Voilá, a completed bulkhead. To my surprise, the Kynar barb fitting inlets were less than half an inch from the

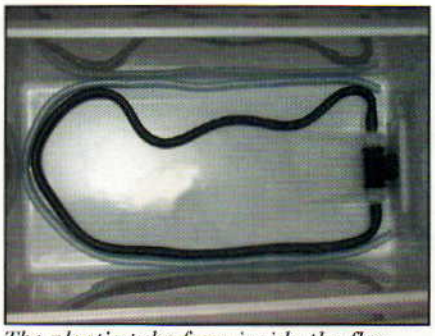
bottom of the tun. No heat-shrink sleeving would be necessary. I was almost disappointed. (If your setup ends up an inch or so above the floor, slip 6 inches of heat shrink tube over the flex, push the flex with its heat shrink tube over the Kynar barb, and gently heat it with a hair dryer or lighted match until it shrinks tight.)

The flex tube we're using comes in various lengths. All flex tubes consist of stainless-steel flex covering an underlying soft plastic tube. The purpose of the flex is to prevent the plastic tube from bursting due to high pressure. Manufacturers make a variety of stainless-steel flex. Some manufacturers make the flex very soft (like the one I'd already cut apart). All the flex I have worked with previously was, in comparison, very rigid. I recommend that you buy the stouter version with a more sturdy weave of stainless-steel for better results.

Faced with this unexpected problem, I laid the tubing I'd removed from the surrounding stainless flex into position next to the flex. This should keep it from moving out to the extreme edges of the mash tun and potentially just sucking up free-running liquid near the edges. Then, because I don't want the tube to have even a remote chance of being pinched off by the weight of the grain, I purchased enough copper screen (20 inch by 12 inch, and bronze or stainless steel would do) to cover the bottom loosely. To prevent scratches I cut the screen a bit too wide and folded an inch back at each side.

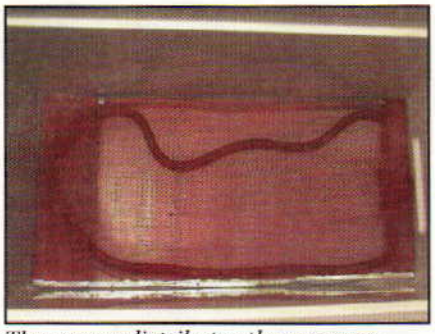
First I folded the screen in half for greater strength and stability. Then I folded one end in 1 inch and the other end to size — about 3 inches. Because the cut screen has hundreds of sharp scratchy wires, I soldered the screen along the entire

I used a Dremel tool to cut the flex from its fittings. Look for a sturdy weave.



The plastic tube from inside the flex will help keep the flex in place.

This is the way the handy stainless flex slips onto the Kynar fittings.



The screen distributes the pressure evenly across the entire surface area.

length of the cut-folded side and added a couple of anchoring spot-solders to keep the folded screen folded. Since soldering requires fluxing (I chose to use beeswax-based flux), I had to wash the screen in PBW (Powder Brewery Wash) from Five Star (www.fivestarchemicals.com). To be sure I neutralized the PBW, I also used their Star-San sanitizer. It's acid to the PBW's alkaline.

The copper screen will distribute pressures evenly across the entire surface area. Its very size — 1/4 to 1/2-inch less than the bottom — keeps it in place. As the grain bed compacts, the screen should push on the flex and compress it until it encounters the firmer walls of the plastic tube, where it will stop. So even if the stainless flex is squished into an oval shape, it will continue to deliver wort to the kettle. The flex itself fit over the Kynar fittings so tightly that the clamps were unnecessary — but keep in mind that yours may possibly require clamps.

Enjoy your big tun

That's it. The project cost was less than $80 and it took only an hour. As cool a device as our big mash tun is, it has one major drawback. The grain bed should be three to five inches deep (minimum) after mash-in to function at optimum efficiency. That means no five-gallon batches of Kölsch or British mild in which the grain bill is well under ten pounds. For smaller batches stick to the round mash tun, or find a smaller chest-type cooler (6 to 8 gallons) where the bottom is smaller and apply the same exact construction techniques. ■

Thom Cannell is a veteran automotive writer and editor and an avid homebrewer. He lives in Lansing, Michigan.

What's New

A new light DME, Czech yeast strains, beer clubs and more

Light DME from Down Under

Coopers Brew Products recently added a light dry malt extract to its popular line-up of liquid malt syrups and pre-hopped beer kits. The Lovibond is about 3 degrees, making it one of the lightest all-malt dry malt extracts on the market. Coopers light DME can be used for brewing all styles of beer. Ask for Coopers Light DME at your local shop or favorite mail-order firm. Suggested retail $3.99/lb. For information, call Cascadia Importers at (206) 548-9262 or visit their Website at www.cascadiabrew.com.

From Czech to Texas

St. Patrick's of Texas has added Bohemian yeasts and hops to its line of Czech homebrew products. The yeasts, from the Urquell and Gambrinus breweries in Pilsen, are known as "H-strains." They come in liquid form and include the Pilsner Urquell H-strain along with the Gambrinus H-strain. The Urquell strain is the traditional yeast used to produce the "original pilsner." These authentic strains were obtained with cooperation from the breweries. Price: $5.50 for each 175 mL package.

Along with the yeast strains, two relatively new Czech hop varieties, Bor and Sladek, also are available from St. Pats. Bor is an early addition hop (7% alpha acid) and Sladek is typically a middle-addition hop (5% alpha acid) with an aroma similar to Saaz. Both varieties are grown in the Zatec (Saaz) region of northeastern Bohemia. The hops are available in pellets as well as whole flowers. Price: $4.87/lb. For more information or to order, call (800) 448-4224 or go to their Website at www.stpats.com.

Fresh Yeast from White Labs

White Labs has introduced a new "Freshness Assurance Program" that should benefit both the retailer and the consumer. The company recently increased its line to 35 strains. If retail shops stock all 35 of these strains, White Labs will take back all unsold, expired vials and supply new ones (with some exceptions).

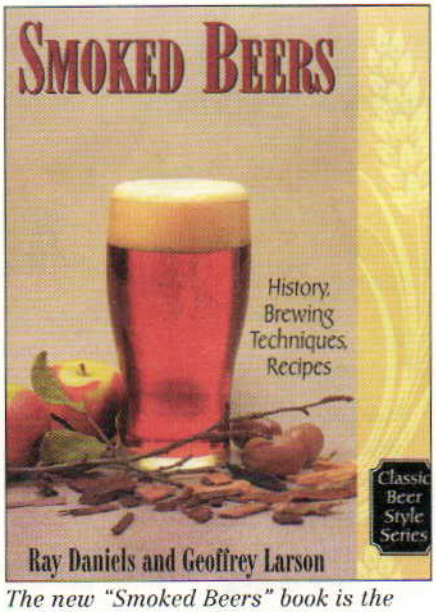
This new deal should encourage homebrew supply shops to stock a wider variety of yeast selections, since it limits the financial risk. And it will help to ensure that the consumer is getting fresh product.

Another objective of this program is to encourage homebrewers to experiment with new strains. Some of the new White Labs strains are California V (WLP501), Hefeweizen IV (WLP380) and American Lager Yeast (WLP840). For more information, contact White Labs by calling 888-593-2785 or go to www.whitelabs.com.

Smoked Beer Book

Brewer's Publications recently released the latest installment in its Classic Beer Styles Series. "Smoked Beers" is the first published guide to this intriguing style. "Smoked Beers" was written by Geoff Larson, founder of the Alaskan Brewing Company in Juneau, Alaska, and homebrew author and editor Ray Daniels.

"Smoked Beers" discusses the evolution of the use of smoke in food and drink and gives instructions on creating beers brewed with smoked malts. It also includes a section on cooking with smoked beers, complete with recipes. The book ends with a section on the chemistry of wood, fire and smoke and the effect that they have on food and drink. Available for $14.95 through bookstores or directly from Brewer's Publications. Call (888) 822-2273.



The new "Smoked Beers" book is the first published guide to this style.

Belgian Beers in your Mailbox

The legendary "beerhunter," Michael Jackson, has launched a new beer-of-the-month club. Called "Michael Jackson's The Great Beers of Belgium," the club was inspired

The shatter-resistant, reusable 6-liter bottles sell for $5 and the dispensing system costs $34.95.

by his book of the same name.

Jackson has selected an inspiring array of Belgian specialty beers that aren't available in the United States. Club members will receive 12 bottles of Belgian beer, each from a different brewery, once a month. One such rare find is Pierre Celis' original grottenbier, a strong dark ale with exotic spices.

The club is currently accepting members, but membership is restricted to 5,000, so interested homebrewers should sign up soon. For more information or to sign up, call Sarah Lessen at (415) 522-1516 or visit www.realbeer.com.

Tap-A-Draft

Sturman Industries in Woodland Park, Colorado, has produced a handy new beer dispensing system that could make the homebrewer's life much easier. Tap-A-Draft is an easy-to-use beverage dispensing system that includes a reusable 6-liter bottle and a screw-on tap. Once you fill the bottle, all you have to do is twist on the tap.

The Tap-A-Draft system keeps your beer carbonated with CO_2. Disposable 8-gram CO_2 cartridges attach to the tap and, as your beer is dispensed, the CO_2 replaces the empty space in the bottle. This system can keep 6 liters of your favorite homebrew carbonated for weeks. If you prefer, nitrogen cartridges can also be used instead of the CO_2 cartridges.

The Tap-A-Draft can also be used for soft drinks, wine or sparkling wine. It's available in 3- or 6-liter bottles. Try your local homebrew shop or order direct by calling (719) 686-6180. Tap-A-Draft retails for $39.95. ■

Brew Your Own relies on retailers, manufacturers and distributors to let us know about new products. Fax your press release to (802) 362-2377 or e-mail it to edit@byo.com.

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Cheese Bowling

Discovering the true purpose of the wheel

by Robert Kratchowill

The notorious cheese wheel, the perpetual cheese bowling trophy and Bob's special-label homebrew.

Former champion Ken Tompkins and 2000 champion and founder Tom Bull.

FOR THE PAST SIX YEARS, MY neighbors Tom and Nicki Bull have been hosting a New Year's Day "milk punch" party. Family, friends and neighbors are invited to drink milk punch (a concoction of milk, brandy and rum with a sprinkle of nutmeg), sample some of the hottest foods and sauces available on earth, enjoy my savory homebrew and, of course, participate in the featured event: cheese bowling. That's right, cheese bowling.

The sport of cheese bowling originated seven years ago when the Bulls received a three-pound wheel of cheese as a slightly odd and belated Christmas gift. While most folks would have consumed the cheese, the Bulls imagined its unique potential. Would this wheel of cheese roll down the stairs, out the front door and down the outside stairs? Would it knock down some plastic pins? From this seed, sprouted the concept of using the cheese wheel as a bowling ball. Thus were the beginnings of cheese bowling.

The preparation for this outdoor extravaganza has expanded over the years to include a fully decorated, lighted bowling alley sculpted from the finest snow Syracuse has to offer. The alley's snow walls are lined with built-in bottle holders. The bowlers choose from an assortment of funky hats to wear before sending the frozen seven-year-old wheel of cheese — forever preserved in duct tape — on its magical ride toward the brightly colored plastic pins.

My homebrew plays a strategic role in my cheese bowling game. A sip or two between the first and second roll drowns out the crowd noise and keeps me focused on making it into the second round. Only the top five scores advance, leading to a showdown in the third and final championship round. Tensions are often high because the coveted cheese-bowler's embroidered sweatshirt and perpetual-bowler's trophy is at stake.

I knew this group was big on hot and spicy foods so I introduced a spicy beer for the 1999 party. It was an old extract and grain recipe from *BYO* that included lots of hops, semi-sweet chocolate and, of all things, habañero peppers. "Hot Chocolate" called for four peppers but that wasn't enough for this gang. I kicked it up to 6 habañeros. This beer was screaming, so I took a couple of bottles with me to the party. Since everybody loved it, I delivered a full case. Washing down "Olives from Hell" with a Hot Chocolate homebrew before picking up the cheese wheel and whipping it down the alley in sub-zero temperatures was sublime.

The following year, Tom asked me to prepare a commemorative beer for the millennium. I waited until the last minute and only had 27 days to brew a beer. I brewed a basic ale, created a snappy label, naturally including the cheese bowl theme, and called it "Milkennium." The name honored the millennium and milk punch. In the spirit of the name, I used lactose in the brew. The 2000 Cheese Bowling Championship was featured on the local sportscaster's "I Challenge Rob" TV series. The homebrew didn't get any TV time but the sportscaster and his cameraman did walk away with a few bottles.

This year's brew was a Belgian Abbey (from the November 2000 issue). I used the DeKoninck recipe and it tasted like the recipe said — creamy, smooth and balanced with some mild floral hop notes in the aroma. The label *(see page 40)* shows a friar standing among bowling pins, grinning at a little cheese wedge character, and states, "Only the Friar Knows the Way of the Cheese Wheel!"

I only bottle and label beers for special events — like cheese bowling — and I keg the rest. It's a great hobby and I get a lot of enjoyment out of it. I think my friends do too. Let's just hope the people who gave my friends that lovely wheel of cheese don't subscribe to *BYO*. ■

Robert Kratchowill has been homebrewing for four years. He lives in Baldwinsville, New York.

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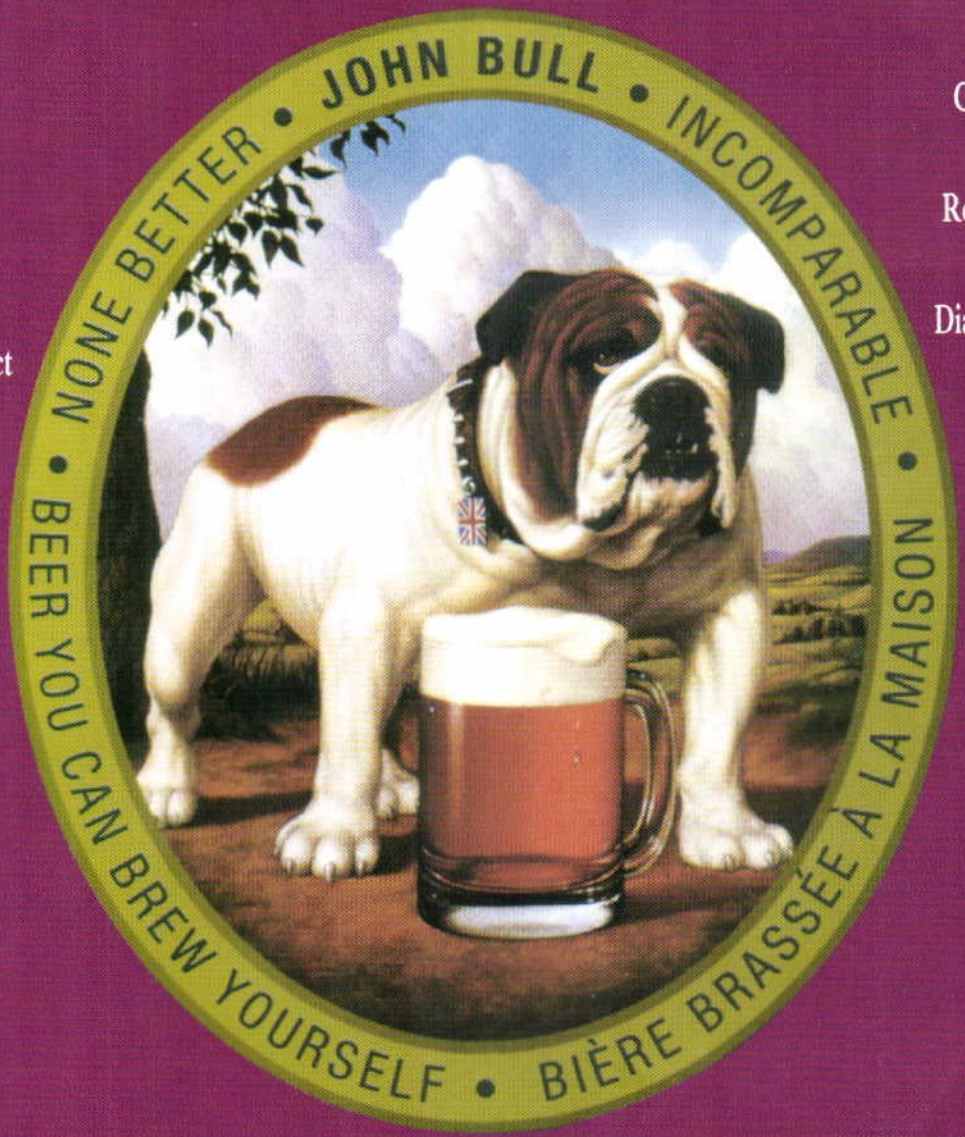

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