Brew Your Own®

October 1998, Vol.4, No.10
Niche Publications Inc.

THE HOW-TO HOMEBREW BEER MAGAZINE

CHOOSING THE RIGHT KIT!

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Cover photo: Kent Lacin

Campaigning Again

Does anybody care about politics any more? Turnout on election day is expected to be around 30 percent, and even that number is dramatically inflated if you count everybody who's eligible to vote but never bothered to register.

Pundits spout a million reasons people don't vote, but I know the real reason. People are bored! For something like 140 straight years there have been two basic choices on election day, Republican and Democrat. Give or take a Populist here or a Bull Moose there, it's been the same thing for generation after generation.

The fact is, it's time for a new party. One that will get people excited. One that will talk about new ideas, new approaches. It's time for the National Homebrew Party!

Now, those of you who have been around for awhile and have long memories — specifically those who never forget when things go wrong — may recall that I attempted to inaugurate the National Homebrew Party (formerly United We Brew America) two years ago during the presidential election. Unfortunately, things didn't work out so well. The Homebrew Party candidate for president, me (hey, it was two weeks before the election; we didn't exactly have time for a national convention), received only two known votes (thanks, Mom).

This time we're starting earlier. Here are a few key NHB Party platforms for anyone interested in campaigning for local office on the party ticket.

Budget: A) Pay the bills. B) Buy brewing supplies. C) Spend whatever's left on beer.

Welfare: Always share brews with friends who didn't make it past A this month.

Interest Rates: Get the credit cards with the low ones.

Defense: Always keep enough beer on hand for a two-front party.

Religion: Lift import duties on any beer made in a monastery.

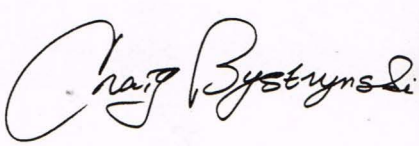
Global Warming: Winter ales for everyone!

Peace Initiative: Clean up the kitchen as soon as you're done and definitely before the next meal (and yes, breakfast counts).

Crime: Mandatory sentencing for people who say yes, they'd love to try your homebrew, then let it sit in front of them without so much as faking a sip (not that I'm bitter).

If you need some inspiration before mapping out your campaign tactics, check out Mikoli Weaver's in-depth article on bock beers ("Bock, in Four Movements," page 36). The article presents historical information, brewing strategies, and recipes for bock and three related styles: maibock, doppelbock, and weizenbock. Weaver, who has written for our sister publication, *BrewPub* (a magazine for brewpub owners, managers, and brewers), is head brewer at Woodland Brewing Co. in Seattle. He brings a unique perspective to brewing. In addition to being a brewmaster, he is a classically trained chef with a culinary degree from Instituto di Cucina Science in Susa, Italy.

Come to think of it, those are pretty good qualifications. I wonder if he has any plans for the year 2000 — say around November!



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EDITOR Craig Bystrynski

MANAGING EDITOR Gailen Jacobs

SENIOR EDITOR Suzanne Berens

ASSOCIATE EDITOR Julie Slama

TECHNICAL EDITOR Mike Ramsey

ART DIRECTOR Christine Kell

GRAPHIC ARTIST Janet Park

CONTRIBUTING WRITERS Alison Crowe, Stan Hieronymus, Daria Labinsky, Scott Russell

EDITORIAL INTERN Amy Simpson

MARKETING DIRECTOR Steve Rank

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PUBLISHING ASSISTANTS Anna Allread, Frank Bernard, Katie Landau, Esther Song

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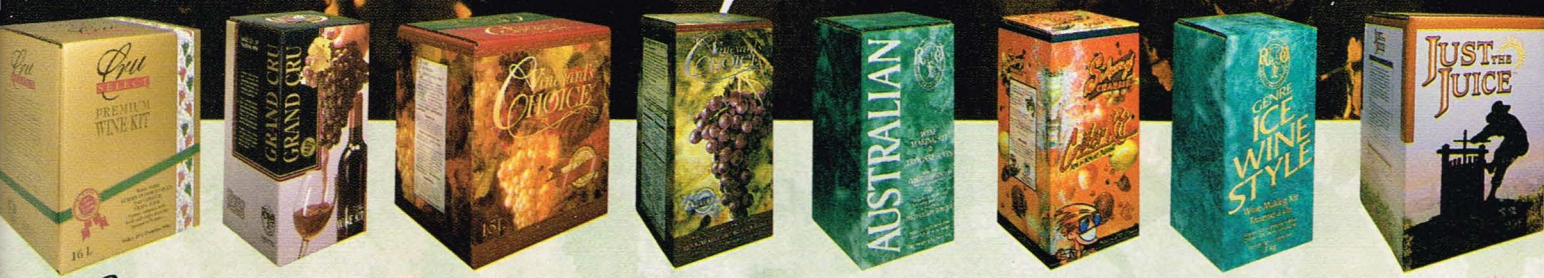
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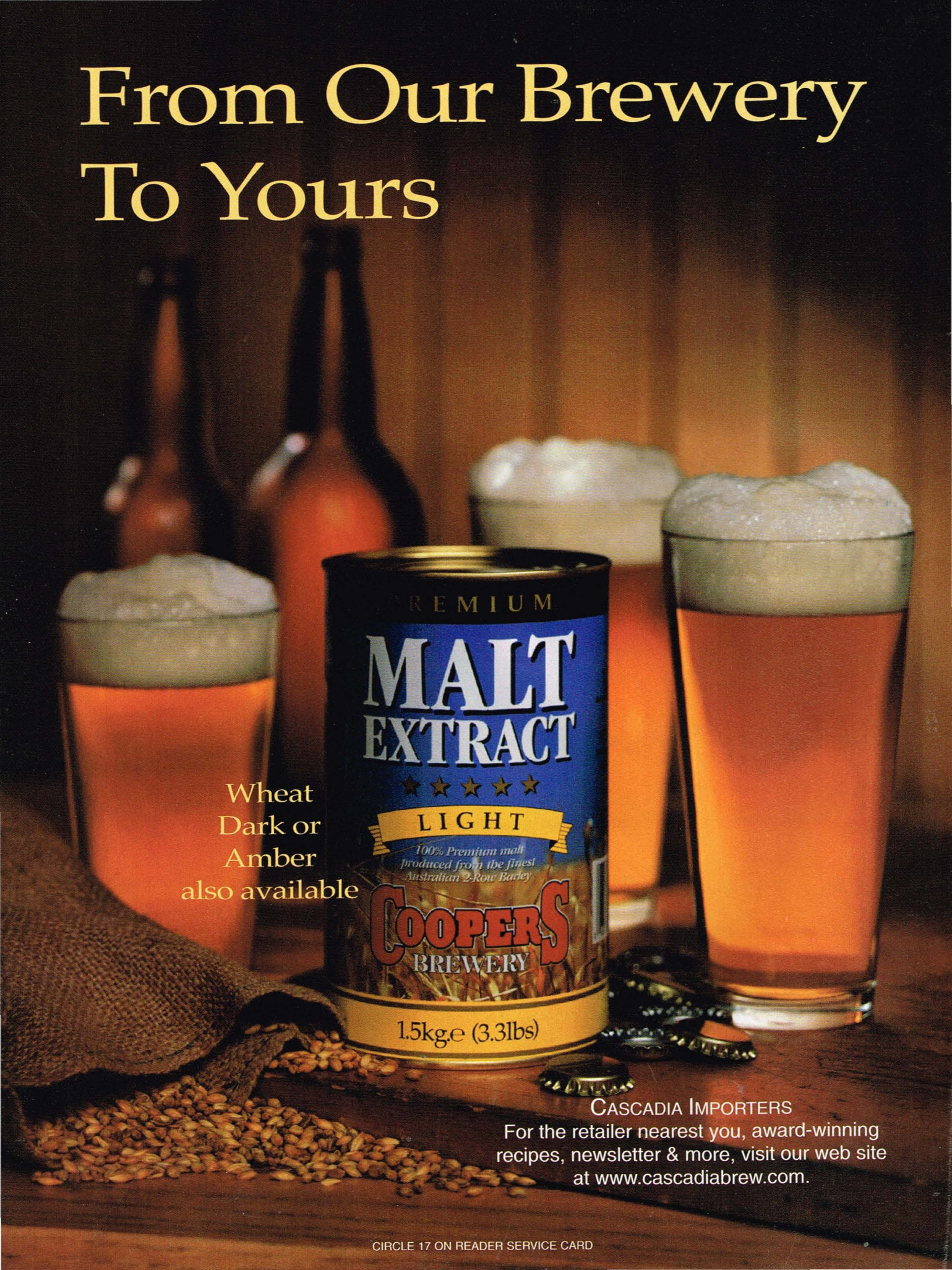
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How I Spent My Summer Vacation

When I was a kid, going to summer camp was the cool thing to do. You got to do fun things like ride horses, canoe on the lake. You got to meet kids your own age who also liked to ride horses and canoe. You also learned useful skills (I'm still the best pre-fire stick piler and I'll never be lost in the woods if there is any moss left on the trees). It seems like the latest trend in vacations for the older kids (in their 20s through their 80s) is to go back to camp. Baseball fantasy camp, dude ranches, spa trips for the ladies. Now there's a camp for me: beer camp.

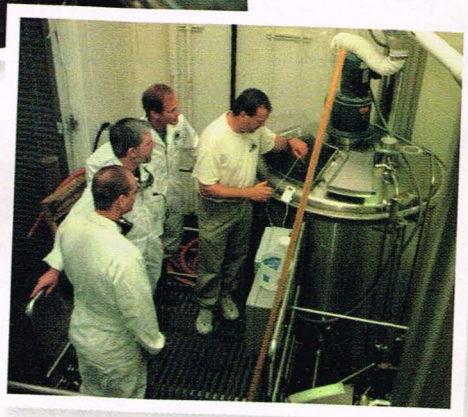
The course, which was sponsored by the American Brewers Guild and held in Woodland, Calif., was "The Brewers Fantasy Camp: The Ultimate Four-Day Brewing Experience."

I'm not talking about a bunch of beer nuts brewing five-gallon batches together and sharing sparging techniques. I met plenty of kids my own age who shared my interest. We got to brew 310-gallon batches on a professional 10-barrel system and went behind the scenes at Sierra Nevada Brewing Co. We also learned new and useful skills (laboratory techniques and brewing).

I'm gonna ask Mom to send me back next year!

— Paul Dineen
San Francisco



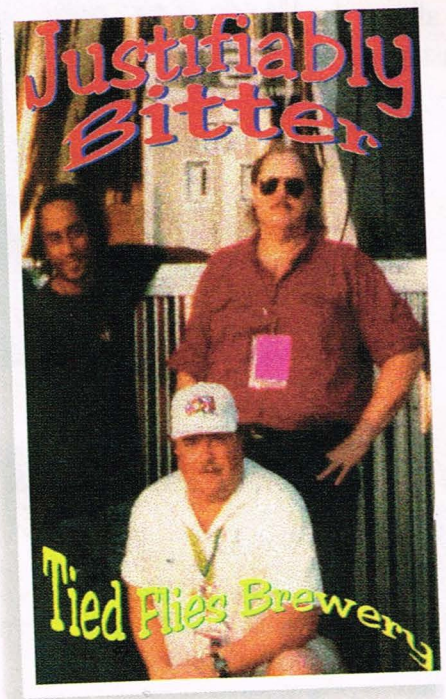


Justifiably Bitter

Sometimes you come up with a great name and create a beer to go with it. This was such a case. The photo used in the label was taken at the 1996 Olympic Games in Atlanta. It was a crew photo of all the people who were working in the lighting tower where the explosion occurred taken two days before the event that plunged us all into history. I cropped it down to just myself, another lighting programmer, and our buddy, Richard Jewel, *the* security guard.

After the events following the explosion, the photo and title just suggested themselves. I have a great letter from the FBI thanking me for my assistance and information that may just find its way into a label next year.

— Zeb Cochran
Henderson, Nev.

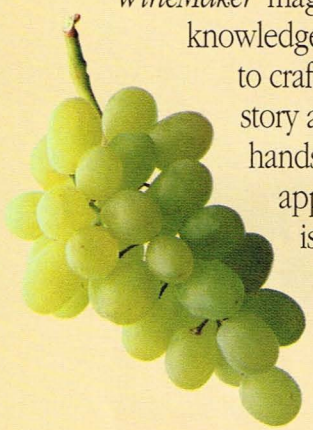




This beer was inspired by the 1996 Olympic Games in Atlanta.

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Editorial and Advertising Office:
Brew Your Own
216 F Street, Suite 160
Davis, CA 95616

Tel: (530) 758-4596
Fax: (530) 758-7477
E-Mail: BYO@byo.com

Advertising Contact:
Evan Shipman, Ad Manager
ad@byo.com

Editorial Contact:
Craig Bystrynski, Editor
edit@byo.com

Subscriptions Only:
Brew Your Own
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Wanted: New Clones

Dear Brew Your Own,

I love reading your magazine every month. I was especially excited when I saw a picture of a Bitburger Pils bottle in the August article about pale beers ("Go for the Gold with Pale Beers").

Unfortunately there was nothing mentioned about Bitburger. I was hoping for a recipe. I was stationed near Bitburg, Germany, during the Cold War (1945 to 1990). I grew to love Bitburger Pils and began homebrewing when I returned to the states to try to duplicate that wonderful bier.

It would be nice if you could do an article about Bitburger Pils. I would like to read any information you could provide about the subject.

Richard M. Fisher
via e-mail

Dear BYO,

Do you have or do you know of anyone who may have an extract recipe for Schlitz or Ballantine XXX Ale?

This may be a rather strange request coming from a homebrewer. My parents drink Schlitz and Ballantine Ale. They do like homebrew but would prefer to stick with their old favorites. I figure that if I can get clone recipes for both I can brew it myself and even though it may taste the same, it will be a much more noble brew than the mass-produced beer they buy now.

I have an all-grain recipe that I have been unable to convert and I figure that somebody somewhere must have a clone for these beers. Normally I would just go for the trial-and-error method, but with a new house and children ages two and seven months, money and time are nonexistent. Any help would be greatly appreciated.

Ken Banestul
Cropseyville, N.Y.

Readers, any recipes? Send us a clone for Schlitz, Ballantine XXX, or Bitburger.

Or send us a recipe you've brewed for the folks. Perhaps a "just like Dad used to drink" Recipe Exchange is in order. As always, free BYO T-shirts to everyone whose recipe is published.

Conditioning With Slurry

Dear BYO,

I read somewhere that freshly cultured yeast slurry and sugar can be added to the bottling bucket to assist in bottle conditioning. The author went on to state that "the slurry from one pint of yeast culture should be more than adequate" but later cautioned against adding too much, which can accelerate autolysis.

How much slurry is too much? Should I use some sort of sugar with all the yeast slurry? How much sugar, if any? I brew five-gallon batches.

Angelo Fertonani
La Jolla, Calif.

Unless you have left your secondary unattended for a couple of months (or fined/filtered your beer), you should have enough viable yeast in solution to do the job.

They will, of course, need a new source of nutrients. Dextrose, or priming sugar (usually corn sugar), will do it. Most people find two-thirds cup per five gallons enough. Mix it with some water and bring it to a boil for several minutes before adding it. Let it cool before adding it to a glass carboy.

Some people like to use malt extract for priming. Just remember: It isn't as fermentable as sugar, and you'll probably need about a cup per five gallons.

If you add yeast, you will still need to add priming sugar. More than the slurry from a pint of culture would be too much yeast.

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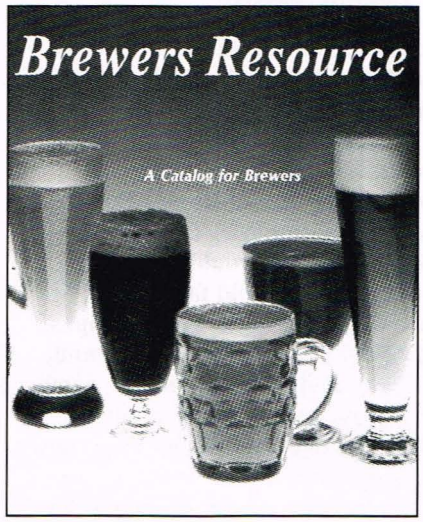
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CIRCLE 11 ON READER SERVICE CARD

You would end up with a thick yeast layer on the bottom of the bottle.

German Lesson

Dear BYO,

I was reading Mail (July '98 BYO) and noticed a question about pronunciation of German beer types. You did the reader little good by only pronouncing one type, hefeweizen. I can't recall all the names and descriptions for German beers, but I'll attempt to list a few for the benefit of your readers.

1. Alt: (*ahlt*), literally, "old" as in altbier. I think it could be translated "old style" or "old fashioned."

2. Helles and Dunkel: (*hell-a* and *doon-kel*), are opposite words meaning "light" (colored) and "dark." "Lite" beer, though less filling, originally referred to the color.

3. Lager: (*lah-ger*), I know this refers to the type of yeast, but the word means "to store." A *lager* is a storage room or space in German.

4. Weihnachtsbier: (*vy-nahks-bier*), is Christmas beer. Technically, the prefix "weihnachts" is a combination of "weihen" (to consecrate) and "nachten" (nights).

5. Märzenbier: (*marts-en-beer*) comes from the word "Maerz," meaning the month of March. I don't know why it is misspelled.

6. Uralt: (*oor-ahlt*) means "very old." For example in another context, Grandmother in German is "grossmutter." Great grandmother is "*ur*grossmutter."

I know this letter might get me flamed by beer purists and German language experts. Please be kind.

Tom Welch
Fairbanks, Alaska

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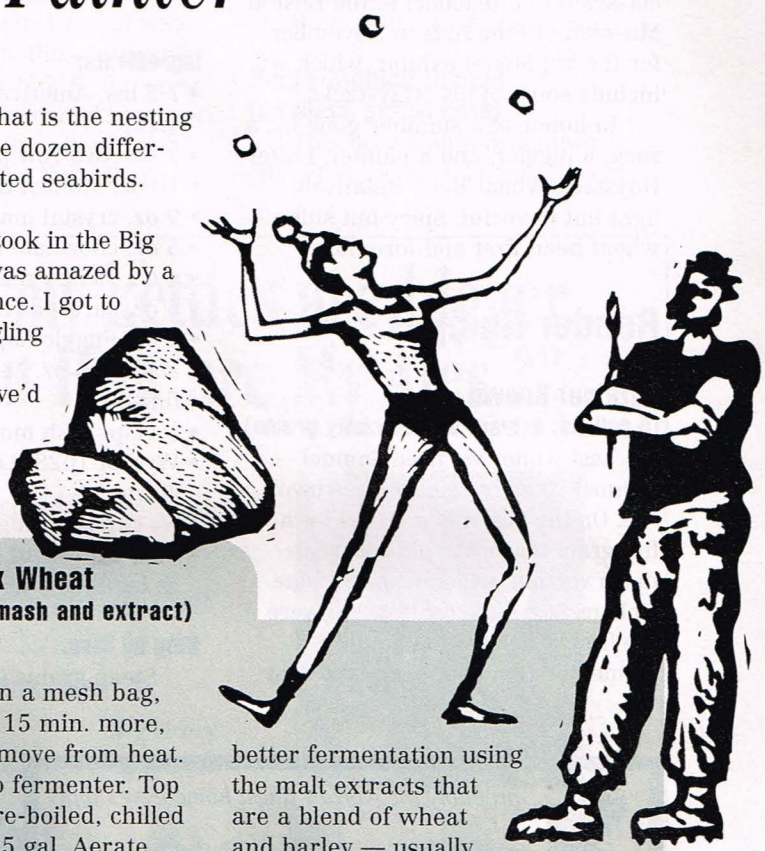
A Rock, a Juggler, a Painter

by Scott R. Russell

The summer of 1998 was a very warm one all over the United States. Wildfires in Florida, record heat waves in the Midwest and in New England, dry, desert-like conditions over most of the Rockies, from Idaho to Arizona. Blame it on La Niña, right? Well, whoever gets the blame, as cooler temperatures move in with autumn, we need to toast the new season.

The key word here is haystack. Three reasons: In June I was at Cannon Beach, Ore., site of the very famous Haystack Rock, a huge chunk of basalt about 150 feet offshore that is the nesting ground for a couple dozen different types of protected seabirds. That's one.

I also recently took in the Big Apple Circus and was amazed by a juggler's performance. I got to thinking about juggling and remembered a street entertainer we'd seen in Burlington, Vt., a huge guy, juggling bowling



Haystack Wheat
(5 gallons, partial-mash and extract)

Ingredients:

- 1/8 tsp. winemaker's acid blend
- 2 lbs. Belgian pilsner malt
- 2 lbs. Belgian wheat malt
- 0.5 lb. medium crystal malt, 55° to 60° Lovibond
- 0.5 lb. flaked wheat
- 4 lbs. unhopped wheat dry malt extract (+/- 50% wheat)
- 1 large pinch loose Saaz hop flowers or 1 Tbsp. or so of Saaz hop pellets (3.6% alpha acid) for 15 min.
- 1 gram spice blend (equal parts coriander, cumin, ginger, wintergreen, and star anise, ground and mixed thoroughly)
- 1 qt. yeast slurry (see note)
- 7/8 cup corn sugar for priming

Step by Step:

Heat 7 qts. water to 162° F. Add acid blend. Crack pilsner and wheat malts. Add malts and flaked wheat to mash water. Hold at 153° F for 90 min. Run off to kettle; sparge with 2 gal. water at about 168° F.

To the kettle add dry malt extract and bring to a boil. Total boil is 75 min. Boil 60 min., add hops (loose hops in a mesh bag, pellets as is). Boil 15 min. more, add spices and remove from heat. Cool and pour into fermenter. Top off with enough pre-boiled, chilled water to make 5.25 gal. Aerate well! At 70° F or so, pitch yeast.

Ferment cool (60° F) for two weeks, rack to secondary, and condition for two weeks near 55° F. Prime with corn sugar and bottle. Age in bottles 10 days.

Notes and Variants:

All-grain version: Mash 5 lbs. each malted wheat and pilsner malt, plus the same amounts of crystal and flaked wheat, same temperature and time but increase mash water to 3.5 gal., sparge water to 4 gal. Time your boil to reduce to 5.25 gal. (add water to kettle if necessary).

All-extract version: Steep the crystal and flaked wheat in 3 gal. of water, heating gradually to 179° F, then remove grains. Increase dry malt extract to 8 lbs.

Wheat malt extract: Although there are a few all-wheat extracts on the market, you will get a better fermentation using the malt extracts that are a blend of wheat and barley — usually about 50/50, but similar proportions will work fine.

Malts: In this recipe I prefer to use Belgian malts (from DeWolf-Cosyns) as they give a fuller, richer malt profile than their German counterparts. But use what you can find; you won't be far off.

Spices: The blend I suggest above is a balanced one, especially if used in moderation. It is very easy to overdo. If you really object to one of the spices, leave it out.

Yeast: Because this is more or less a Belgian recipe, I prefer to use a Belgian yeast. Wyeast has two strains of Belgian wheat beer yeast, 3944, which is better suited to a real "witbier" — which this is not — and 3942, softer, less acidic and, I think, perfect for this recipe. Avoid using the Bavarian or Weihenstephan wheat strains as they are too fruity and estery for this recipe.

balls, flaming torches, toy trucks, fruits, vegetables. He called himself Haystack.

Third, I plan to take my French classes (I'm a teacher) to the Boston Museum of Fine Arts in November for the big Monet exhibit, which will include some of his "Haystacks."

In honor of a summer gone by, a rock, a juggler, and a painter, I offer Haystack Wheat Beer. Relatively light but flavorful. Spicy but still a wheat beer, first and foremost.

Reader Recipes

Hazelnut Brown

(5 gallons, extract and specialty grains)

Last winter we tried Samuel Adams' LongShot Hazelnut Brown Ale. On the box was a recipe for a full-grain mash. We did a partial-mash version, which won two blue ribbons at a state contest. We were the first recipients to win the Tennessee Homebrewer of the Year contest. And we got to brew a large batch at Bosco's Pizza Kitchen and Brewery in Germantown, Tenn.

John and Doran Moranville
Memphis, Tenn.

Ingredients:

- 7.5 lbs. American pale extract syrup
- 2 lbs. two-row pale malt
- 10 oz. Munich malt
- 9 oz. crystal malt, 10° Lovibond
- 5 oz. chocolate malt
- 4 oz. victory malt
- 5 oz. cara-pils malt
- 2 oz. Fuggle hop pellets (5% alpha acid): 1.5 oz. at 60 min., 0.5 oz. at finish
- 1/2 tsp. Irish moss for 15 min.
- Wyeast 1028 (London ale) yeast starter
- 3/4 cup corn sugar for priming
- 0.85 oz. Noirot Hazelnut essence at bottling

Step by Step:

Steep grains in grain bag in 3 gal. of water at 150° F for 30 min. Remove grains and add liquid malt and bring to boil with 1.5 oz. Fuggles. Total boil is 60 min. Boil 45 min. and add Irish moss. Boil 15 min. more. Add 0.5 oz. Fuggles and turn off heat. Cool to 80° F, remove hops, and pitch yeast.

Ferment for seven days at 68° F. Transfer to secondary and ferment for 17 days at 66° F. Prime with corn sugar, add hazelnut essence, and bottle.

OG = 1.060
FG = 1.023

Christmas Porter

(5 gallons, extract and specialty grains)

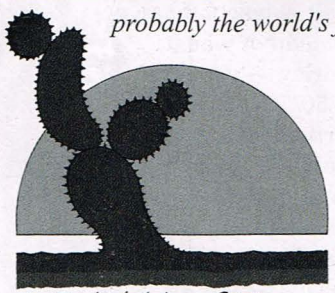
This is a nice, warming brew for the holidays or anytime you need it. If you like a strong brew to warm the body, give it a try.

Don Bouslog
via e-mail

Ingredients:

- 10 lbs. red malt extract
- 8 oz. black patent malt

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- 8 oz. crystal malt, 120° Lovibond
- 4 oz. chocolate malt
- 8 oz. biscuit malt
- 1 lb. brown sugar
- 0.75 oz. Galena hops (11.6% alpha acid) for 60 min.
- 2 oz. Mt. Hood hops (4.5% alpha acid); 1 oz. for 20 min., 1 oz. at end of boil
- 1 tsp. gypsum
- 1 tsp. Irish moss
- 2 packages Wyeast 1056 (American ale)
- 1 oz. Kent Goldings (4% alpha acid) for hop tea
- 3/4 cup corn sugar for priming

Step by Step:

Steep grains in grain bag in 6 gal. of 155° F water for 60 min. Remove grains, add malt extract and brown sugar. Total boil is 60 min. At boil add gypsum and Galena hops. Boil 40 min. and add 1 oz. Mt. Hood. Boil 10 min. more, add Irish moss. Boil 10 min. more. Add remaining Mt. Hood, turn off heat. Cool to 76° F and pitch yeast.

Ferment for four days. Transfer to secondary and ferment for seven days. Transfer again and let sit for five days. Add hop tea (add hops to 16 oz. boiling water for 3 min. Strain through coffee filter). Prime with corn sugar and bottle at 1.022. Age for six weeks to three months.

OG = 1.078
FG = 1.054

Silly Old Bear Honey Wheat
(5 gallons, extract and specialty grains)

After two weeks: not bad, but strong odors. Three months: tastes great! Strong odors are gone. Four months: perfect. The longer it sits the better it gets. One year: best yet.

Kraig Krist
Annandale, Va.

Ingredients:

- 7 lbs. light malt extract
- 1 lb. crystal malt, 10° Lovibond
- 6.6 lbs. wheat malt extract
- 2 lbs. clover honey
- 1 oz. Tettnanger hop pellets (4.4% alpha acid) for 45 min.
- 1 oz German Hallertauer hop pellets (3.5% alpha acid) for 10 min.
- 1/2 tsp. Irish moss
- 1 pkg Wyeast 3068 (Weihenstephan wheat)
- 7/8 cup corn sugar for priming

Step by Step:

Place cracked crystal malt in grain bag and steep in 1 gal. of water at 155° F for 30 min. Rinse grain bag with 2 gal. water at 165° F. Top up to 5.5 gal. and add extract and honey as you bring to a boil. Stir often. Total boiling time is 60 min. Boil 15 min. Add Tettanger hop pellets. Boil 35 min. more, add German Hallertauer hop pellets and Irish moss. Boil 10 min. more. Cool, transfer to fermenter, and pitch yeast at 70° F.

Bottle after 14 days. Prime.

Paul's Munich Dunkel
(5 gallons, partial mash)

This beer won a first place ribbon in the dark lager category

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at the Sea Lion Suds Fest in Gold Beach, Ore.

Paul Mabie
Chico, Calif.

Ingredients:

- 2 lbs. two-row lager malt
- 2 lbs. pale ale malt
- 8 oz. light German malt
- 5 oz. chocolate malt
- 8 oz. caramel malt, 60° Lovibond
- 1 lb. light British dry malt extract
- 2 lbs. light malt extract
- 1 tsp. sea salt
- 0.75 oz. Nugget hops (16.6% alpha acid) for 50 min.
- 1 oz. Fuggle hops (6.1% alpha acid) for 10 min.
- 1 oz. Northern Brewer hops (8.1% alpha acid) for 5 min.
- Wyeast 2112 (California lager)
- 3/4 cup corn sugar for priming

Step by Step:

Add grain to 1.75 gal. of 163° F mash water. Hold at 152° F to 155° F for 60 min. Mash out at 168° F to 170° F for 5 min. Sparge with 3.75 gal. of water.

Top up to 5.5 gal. water. Add sea salt, and extract. Total boil is 60 min. Boil 10 min., add Nugget hops. Boil 40 min. more, add Fuggle hops. Boil 5 min. more, add Northern Brewer. Boil 5 min. more. Cool to 72° F, transfer to fermenter. Pitch yeast.

Ferment at 163° F to 165° F for 12 days, then transfer to secondary. Let settle two weeks. Bottle with priming sugar and condition for two months (if you can wait).

OG = 1.052
FG = 1.018

Grendel's Altbier

(5 gallons, extract and specialty grains)

A full-bodied amber ale in the German altbier style. Malty with subtle bitterness and a clean finish.

Stephen Spencer and the Crew
Liberty Malt Supply
Seattle

Ingredients:

- 6 lbs. light malt extract
- 1 lb. light dry malt extract
- 12 oz. Munich malt
- 4 oz. wheat malt
- 2 oz. Special B malt
- 1 oz. Perle hops (8.4% alpha acid) for 60 min.
- 1 1/2 oz. Hallertauer hops (4.2% alpha acid); 1/2 oz. for 30 min., 1 oz. for steeping
- Wyeast 1338 (European ale)
- 3/4 cup priming sugar

Step by Step:

Steep grains in 2.5 gal. of water at 150° F for 20 min. Remove grains, add extracts, stir well, and bring water to a boil. Total boil is 60 min. Add Perle hops. Boil 30 min. and add 1/2 oz. Hallertauer hops. Boil 30 min. more. Turn off heat. Add 1 oz. Hallertauer and steep for 5 to 10 min. Cool. Transfer to carboy and top up to 5 gal. with chilled, pre-boiled water. Pitch yeast at 80° F or below.

OG = 1.050
FG = 1.010 to 1.012 ■



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CIRCLE 32 ON READER SERVICE CARD

The Key to Wort Volume

Mr. Wizard

I have been homebrewing for more than a year and a half. I've mainly been extract brewing with great results, but I have reached that point that every homebrewer has reached, or will reach: the need to move on to grain brewing. Almost every grain recipe (partial mash or all-grain) suggests bringing the volume of wort to six gallons before boiling, even if the runoff after sparging is less than six gallons. Typically in an extract batch I use two to three gallons of water to boil my wort, then add enough pre-boiled and cooled water to bring my volume to five gallons prior to pitching.

What effects could boiling an all-grain or partial mash wort at a volume of less than six gallons have on my overall batch if I were to add preboiled tap water to the wort (to five gallons) prior to pitching? It seems the pre-boiled, cooled water would help cool the wort quicker to pitching temperature.

Thomas A. Adamczak
Grand Rapids, Mich.



This question really has more to do with sparging than it does with the volume of wort to boil. An all-grain brew begins with the mashing process. During mashing, starch is converted to fermentable sugars. A good portion of the sugars are released into the liquid portion of the mash and create wort, but many of the sugars stay trapped in the malt particles. When wort run-off begins, the first wort that flows from the grain bed is the wort outside of the grain particles. In winemaking, this would be termed the free-run and represents the highest quality must (wine's equivalent of wort) flowing from the grape. Winemakers press the juice out of the grape, and brewers rinse the malt sugars from the grain bed by sparging. In both cases the objective is to increase yield.

Most brewers sparge long enough to rinse most of the extract from the grain but stop sparging when the wort gravity drops below about 1.008 specific gravity. Some brewers measure wort pH as it flows from the grain bed and stop collecting wort when the pH approaches six. The reason for rejecting high pH and low specific gravity wort (the two cases usually correlate well) is that unwanted materials begin to dominate the composition of wort. The last runnings from the grain bed will contain more tannins (polyphenols) than fermentable sugars if too much weak wort is collected. This can give beer an astringent mouthfeel. As a rule of thumb, it's time to stop sparging when the wort ceases to taste sweet and begins to taste like a weak cup of tea.

In a controlled system where everything relating to extract yield (malt milling, mash temperatures, mash thickness, sparge temperature, grain-bed thickness, wort flow rate from the grain bed, and so on) is held constant brew after brew, the point at which wort collection stops is fairly constant. This is why many commercial breweries collect a constant volume of wort in the brew kettle for a given recipe.

Homebrew recipes always should be read with a grain of skepticism, because the author of the recipe may have different equipment than you do. When I use another brewer's recipe, I follow the ratio of malt specified in the recipe and use the recipe's hopping schedule, but that's about it. I have my own preferences regarding mash thickness, sparging technique, and fermentation practices. I view recipes as a general guide. If a recipe says to collect six gallons of wort, I read that as somewhere around six gallons depending on when the wort gravity drops below my own benchmark of quality. The main goal I try to hit relating to the recipe is wort original gravity, because that has a big influence on beer flavor.

Another variable to watch with respect to wort volume is hopping. If the recipe calls for 2.5 ounces of hops for a five-gallon batch and you end up with 2.5 ounces in a four-gallon batch, be prepared for more bitterness than the recipe describes.

The bottom line is if you get all the extract out of the grain before hitting six gallons, then you've done well. In fact if you get a good yield, you may have to add water to dilute the wort gravity down to the gravity called for in the recipe. You may also have to use more hops to get the same bitterness because of the increased wort volume. In most cases this tweaking will be minimal and you probably will end up collecting somewhere between five and six gallons of wort to get all the sugar out of the grain bed.

If you collect less wort than specified by the recipe, the wort you boil will be a higher specific gravity. This means you may get a little more wort darkening during the boil and your hop utilization will

probably go down a bit. If you then add water at the end of the boil to bring the volume up to five gallons, the wort gravity will most likely be low because that water should have been used to rinse the goodies from the grain.

There are commercial brews that actually sacrifice extract yield for flavor (imagine that!). One notable example is Kirin Ichiban. Ichiban has several slightly different meanings in Japanese, but in vague terms it means "first" and is often used to denote premium quality. Kirin Ichiban beer is made by collecting just the first wort or "free run" from the grain, and the wort gravity is diluted to a normal level with water. This practice eliminates all the "nasties" potentially extracted from the grain during sparging but in the process reduces the wort volume yield from the grain. Kirin markets this brewing practice in the same way many wineries market using only "free run" must for their wines. If you did this at home, a five-gallon recipe would turn into a three-gallon batch or you could use about 1 2/3 times the amount (five-thirds more) grain and produce five gallons of wort post-dilution.

I'm not sure what type of answer you were in search of, but hopefully I have addressed your concerns. *Kampai*!

Mr. Wizard

I was wondering if you could give us your expert opinion on whether or not you should 1) remove hops and 2) remove trub.

The only reason I can think of for removing hops is if one has a chiller that might get clogged. During racking into my keg, I also get some floating "junk" in my beer if I don't first rack my beer from the primary fermenter into a secondary fermenter. Most of the time I just rack into my keg. Please help. I'm sure I'm not the only one who wonders about this, although my beer tastes good.

Jon Bloomquist
Omaha, Neb.

If you don't mind the "junk" floating in your beer and you don't reuse your yeast, then hop and trub removal are probably not necessary. For that matter, you probably don't have to separate the wort from your malt. Seriously, a good beer could be made by mashing the malt, boiling the whole mash with hops, and then letting it cool before adding yeast. At the end of fermentation you could then separate the beer from the rest of the mess, perhaps with a straw equipped with a coarse filter. Many traditional "beers" are made in this manner and more closely resemble a porridge than a beverage. This is also how whiskey is made, but the liquid is separated through distillation.

Given the option, I would advise

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CIRCLE 36 ON READER SERVICE CARD

hop and trub removal because that is how beer as we know it is made. Leaving the hops in the fermenter will have a different flavor effect, and leaving the trub in the wort will also affect flavor. Furthermore, if you plan to reuse the yeast, a practice I recommend for several reasons, trub separation is advisable because trub leaves a film on the surface of the yeast cell, leading to longer lag times in subsequent fermentations. Also, you have better chances of brewing a clear beer if you remove sediment when you can.

I view brewing as a continual process of extraction and purification. Wort production extracts sugars, colors, and flavors from grain and releases bittering compounds and a wide variety of aromas from the hops. Yeast processes fermentables into alcohol, carbon dioxide, and flavor compounds. Some flavor compounds, such as sulfur aromas, are vented from the beer, and others are retained for their pleasant aromatic properties. Clear beer is then separated from yeast solids, often by using a filter or some sort of yeast fining. Finally, our body extracts the alcohol out of the beer and the whole process is brought full circle.

My philosophy is simple: When brewing beer, extract and purify when given the chance, especially if the action affects flavor positively. If removing something from the beer, for example yeast removal via filtration, is found to be detrimental to flavor, don't remove it.

Mr. Wizard

I've been brewing my own for just about a year now. I started doing all-grain about eight months ago. For the most part, I am very pleased with my own beers. Recently, I decided to start entering competitions to get feedback and a sense of how I am doing.

I have now entered seven different beers in three different contests. None of my beers have won any awards. I have not received any score above 30, and have received three scores under 20.

The most common comment on my judge's sheets says "perhaps more maltiness would help." I don't understand what the judges are asking for.

I do not skimp on malt. I use what the grain bill in the recipe calls for and do everything I can to faithfully reproduce the styles. I put all my beers through two or three different computer programs. I calculate original gravity and take both OG and final gravity readings. My OG readings are always at least close. My yeast seems to be working fine, as my FG readings are in a good range.

What could be causing the judges to tell me my beers don't have enough malt? Is it a flavor they're looking for, or more a lack of body or something else? I would appreciate any ideas, because I am quickly getting tired of seeing this comment on my score sheets.

Bill Wible
Philadelphia

This is one of those things about brewing that just sets me off! I personally hate competitions because of what they do to some people like yourself. It sounds like you are entering competitions not so much to be competitive but simply to get some good feedback. What you want is some good analytical sensory evaluation. This is an area in which I have much more hands-on experience compared with preference panels.

In a solid, objective sensory panel, a judge simply rates what he detects without placing a subjective rank on the beer. For example most people would agree that oxidation is a negative beer quality. A judge participating in an analytical sensory panel would rank the intensity of the oxidation but would not be required to apply a qualitative rank to this trait. In fact one of the underlying principles of analytical sensory panels is that judges should never be asked to apply both quantitative and qualitative responses to a sample. This is simply a matter of common sense. Suppose a person weighs 280 pounds and you are required to comment of the merits of that weight. For many people a weight of 280 pounds would be unhealthy, but if you are 7 feet tall that weight is not very alarming.

In a beer competition the judges use style as a standard of comparison. A pale ale is supposed to be x, y, and z to be "stylistically correct." If the beer is out of style, then you are out of luck, no matter how delicious your golden ale may be. A comment of "lacks maltiness" doesn't mean your beer lacks malt flavor but simply says the judge believes a typical pale ale should have more malt character. Enter the same beer as a light lager and the same judge may comment "excessive malt character and fruity aromas." Again, this doesn't mean your beer has the body of a doppelbock with the fruitiness of a Tahitian punch; it just means that it has more than a beer typical of the light lager style.

Beer styles are good for pigeonholing beer, but they can really tie your hands when brewing what suits your personal preference. Imagine if Picasso's art were entered in a competition against works by Monet and Manet; his stuff would look pretty weird and out of style, but does that have anything to do with the merits of the work?

There are a lot of brewers out there who would be happy as clams if they entered a pale ale in a competition and the judges awarded them a blue ribbon and commented "couldn't be any closer to a Sierra Nevada Pale Ale — good job!" Hell, I'd be pretty happy with that, but if I really want a Sierra Pale, I can buy some at the store. Sure, it's a challenge and all, but when it comes right down to it, brewing to style can be pretty uncreative.

On the other hand, the judges may have a legitimate comment. Many homebrews I have tasted lack malt character. This comment doesn't imply their creators are skimping on malt. Rather, it means the beer lacks good malt flavor. A malty beer possesses complexity of flavor associated with malt. The term "malty" is not a singular property. Pale ales with a rich, toasty backbone are malty, and doppelbocks with caramel, toffee,

and lingering flavors reminiscent of sweet bread are termed malty. The term malty is nebulous, but all experienced brewers can spot malty flavors.

Beers that lack maltiness are not flawed because of a problem with a computer calculation. They do not lack maltiness because of a bad recipe, and beers do not lose maltiness because of the yeast strain. Beers lack maltiness because they are missing the flavors associated with the term malty. Most malty flavors in beer arise during malt kilning.

Budweiser lacks malty flavors because it is made from very pale malt and rice, neither of which contains any appreciable amount of the Maillard reaction products that make beer malty. The brewmasters at Anheuser-Busch don't want Budweiser to taste malty, but that doesn't stop people from constantly bagging on it for its thin body. Budweiser is also the world's best-selling brand of beer. Paulaner Salvator is malty because it has a generous portion of Munich malt, which has a lot of malty compounds, and because it is a high-gravity beer, which simply means there are more malty flavors per volume of beer. Paulaner Salvator is a terrific beer, but its sales fall very short of Budweiser's.

The Maillard reaction occurs when certain sugars (reducing sugars) react with the alpha-amino group of amino acids and proteins under conditions of moderate moisture, high pH, and heat to form a host of flavors and colors. When you toast bread, the toasty aromas are Maillard reaction products.

If you agree with the judges that your beer lacks maltiness, change your recipe. Use higher-kilned ale malts as your base malt if you are using a lightly kilned lager malt. If you still need more maltiness, substitute some Munich malt for a portion of your base malt. If you still want more maltiness, brew higher-gravity beers. However, if you like your beer and the only reason you want to change the maltiness of your beers is so you don't have to see that damn comment again, enter your beers in a category that doesn't specify malty as one of the mandatory qualities! ■

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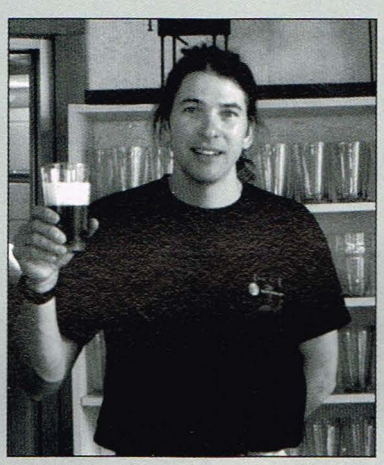
Do you have a question for Mr. Wizard? Write to him c/o *Brew Your Own*, 216 F St., #160, Davis, CA 95616. Or send e-mail to wiz@byo.com.

Mr. Wizard, BYO's resident expert, is a leading authority in homebrewing whose identity, like the identity of all superheroes, must be kept confidential.

Brewing on the Snake

by Thomas J. Miller

Snake River Brewing Co.



"All of a sudden we saw the grain bursting apart, the color of the mash changed, and the aroma changed. It's a truly magical process where you can stick your finger into the mash and say, 'That tastes good!'"

Brewer: Will Gilson



Brewer: Will Gilson
Brewery: Snake River Brewing Co.
Years of experience: 6 years professional experience
Education: Siebel Institute of Technology short courses, homebrewing
House Beers: Snake River Lager, Pale Ale, Zonker Stout

When former Wall Street analyst Albert Upsher opened an Anheuser-Busch distributorship in Oregon, he knew he had allied himself with the best.

A-B's massive distribution network guaranteed him the freshest beer available. Its beer line-up was revered nationwide, and its marketing muscle never stopped pumping.

Things were going well when the microbreweries came to town. Suddenly, however, Upsher watched enthusiasm grow for the niche beer market. He became convinced that a mystique surrounded these little-known craft brews and that the market was destined to grow. Increasingly, he considered opening his own brewery. On several occasions he consulted with possible business partners and quite nearly signed an agreement with a Portland operation.

Finally, he could resist no longer. Upsher sold his distributorship and moved to Jackson, Wyo. Undoubtedly, friends and family must have thought he was crazy. A town of barely 6,000 inhabitants nestled below the Tetons in northwestern Wyoming, Jackson hardly seemed the place for a brewery with a 3,500-barrel annual capacity. But with a well-known ski resort and a summer tourism crowd exceeding 2 million visitors, Upsher was convinced Jackson would provide significant exposure for his upstart microbrewery.

"With a selection of high-quality beers and a location in downtown Jackson, we had a chance to build a brewery with widespread recognition," he says.

History has proven Upsher's theory correct. Since 1995 the brewery has expanded its capacity to 4,500 barrels, with an annual revenue increase from $1.2 million at opening to more than $2 million today. At the Great American Beer Festival, Snake River Brewing Co. consistently wins medals. Awards include two silver medals and one gold for the Zonker Stout, two silver medals for the Snake River Pale Ale, a silver for Custer's Last Ale (IPA), and a silver for the ESB.

Snake River is a microbrewery/brewpub combination, with 75 percent of product sold off-premise. "Most of that is sold right around here in Montana, Idaho, and Wyoming," says Upsher. "Probably around 70 percent. We want to stay within a day's drive of here. We strongly believe it won't benefit us to get our distribution too spread out."

Limiting distribution also preserves the exclusivity of on-premise sales. "It's one of those things that people like to do while they are here," says Upsher, "and as long as there are tourists, we have a

self-made market. In Munich every tourist will visit the Hofbräuhaus. We want it to be the same for us. And if this is the only place they can get (our beer), people will come in."

The brewery's flagship beers include the Snake River Lager, Pale Ale, and Zonker Stout. Each is bottled in the 22-ounce "Bomber" as well as traditional 12-ounce bottles. The lager, with an original gravity of 1.052 and 5.6 percent alcohol by volume, has seen considerable improvement over the last year. Different malts, lower fermentation temperatures, and a new hop profile have all contributed to the new beer.

Hop heads flock to the pale ale for its enticing blend of Cascade and Centennial finishing hops. This golden ale employs Chinook for its bittering hops. With an original gravity of 1.050 and an alcohol by volume of 5.4 percent, it is the perfect brew for one of Jackson's beautiful summer days.

But for one brew that truly defines Snake River Brewing Co., look no further than the Zonker Stout. "This is a niche-market beer," says Upsher. "I think it is as good as a stout can get." The beer derives its name from the Zonker fly, used by fly fishermen to lure monstrous cutthroat trout from the depths of the Snake River. Like its namesake, Zonker Stout attracts the heartiest beer drinkers with its blend of Chinook, East Kent Goldings, and Willamette hops. The original gravity of 1.060 creates an alcohol by volume of 5.7 percent, which can prove debilitating at Jackson's high elevation.

Last year Upsher turned his team of skilled brewers loose with an in-house promotion dubbed "The Snake River Signature Beer Series." Upsher's brewers are challenged to design, test, and ultimately brew their own favorite recipes.

Results have been well received. Hoback Hefeweizen was the original signature beer. Brewed in the traditional Bavarian fashion, the hefe-weizen boasts a spectacular array of banana and clove flavors. The brew is unfiltered, which accentuates the aroma and flavors. The original gravity is 1.050, with an alcohol content of 5.2 percent by volume.

Other signature beers include McBreezley's Ale, created by brewer Steve Breezley in the tradition of the American brown ale, Monkey's Dunkel, developed by brewer Cory Buenning in admiration of a traditional Munchener dunkel, and Diplopian Belgian Ale, the brainchild of brewer Hadley Cox.

"In the world beer championships, the Diplopian ranked right up there with several (beers from) Belgian breweries," says Upsher. "There were all these famous Belgian names and then Snake River right in the middle."

Locals, however, came in hoards for the unveiling of the Discombobulator Mai-Bock, designed by brewer Will Gilson. This powerful brew arises from the traditional German brewing technique known as decoction mashing, which calls for boiling a portion of the mash. The result is a rich malt character that can't be achieved with the typical infusion mash.

"When we first tried brewing the Mai-Bock, it was too sweet but not malty sweet," says Gilson. "My goal was to have more maltiness. I figured I needed a strong boil with a decoction mash to get that."

At first Gilson got things boiling in the brewery's infusion mash tun. But the steam jacket proved insufficient to get an efficient boil.

"It was impossible to regulate how much grain we were boiling," says Gilson, "and we didn't know how well it was boiling, either."

The solution came when Gilson procured a 60-gallon steam-jacketed soup pot. On brew day, Gilson scooped out some carefully measured grain, dumped it into the boiling vessel, and turned up the steam.

"All of a sudden we saw the grain bursting apart, the color of the mash changed, and the aroma changed," he says. "It's truly a magical process where you can stick your finger into the mash and say 'That tastes good!'"

The Mai-Bock employs two-row pale, Munich (7° Lovibond), carastan (34° Lovibond), and cara-pils malts. Hops include German Tettnanger and Hallertauer added during the two-hour boil at 30 minutes, one hour and 45 minutes, and two hours. This mind-bending brew starts with an original gravity of 1.072 and boasts a whopping alcohol by volume of 8.3 percent.

The Tips

- **Use a decoction mash with a strong boil.**
- **Use treated (filtered) water.**
- **Use a chiller to quickly reach low pitching temperatures (50° to 55° F) and build up your yeast to compensate for the low temperature.**
- **Ferment at low temperatures (48° to 55° F).**

Tips on Brewing Maibock

"I tried lots of bocks when I lived in Germany, including the darker bocks and the maibocks," says Gilson. "These days in America, there are lots of bocks that are all caramel. I don't like that. It doesn't taste as good."

The trick starts with the decoction mash. Decoction is the mashing style that requires parts of the mash to be separated and boiled. Although it is falling out of favor with many professional brewers, who consider it labor intensive and outdated, Gilson swears by it.

"It's the most important thing you can do," he says. "Dig out as much of the grain as you can and bring it up to a strong boil. It really helps enhance the flavor of the base malts so that you don't have to rely

on color and flavor by adding a bunch of specialty grains."

Base malts, of course, come in all forms. Traditionalists might lean toward European malt. But Gilson believes domestic malt can achieve equally good results.

"You'd really have to experiment to see if you could taste the difference," he says. "But my experience has been that the decoction mash is sufficient to build flavors in the domestic malts."

Water, fermentation temperatures, and yeast choices are extremely important, says Gilson. Unfiltered water can lead to off-flavors. Treated water not only makes your beer taste better, it can improve the efficiency of your system at mash-in and sparge.

"Acidic water helps to rinse the grain and extract the sugars from the malt," says Gilson.

Maibocks, of course, are lagers. To protect from off-flavors, they require low fermentation temperatures. At Snake River the Mai-Bock and other lagers ferment at 50° F, which falls at the lower end of the 48° to 55° F range accepted by most breweries.

To hit the right fermentation temperature, Gilson recommends that you invest in a counterflow wort chiller. In this contraption, hot wort runs in the opposite direction of cold water. When the wort exits the other end, its temperature has dropped to tap water temperature or below.

"You can always slow the flow of wort running through the wort chiller," explains Gilson, "so that it has more time to be chilled by the water circulating around it. It will bring the temperature down another degree or two. Then all you need is a refrigerator to keep the temperature at 50° F."

Low fermentation temperatures also make for tricky yeast handling. If you plan to pitch around 50° F, a small package of yeast will cause significant lag time.

Gilson strongly recommends that brewers learn to grow their yeast up, doubling or tripling it above the original volume. "It's important to have enough yeast to quickly take over the chilled wort," he says.

Take heed, however, not to grow your lager yeasts at high temperatures. Treat them to the same conditions as your final batch. If you culture a yeast around 80° F, it might not only produce funky flavors, it could also fail to reproduce at low temperatures.

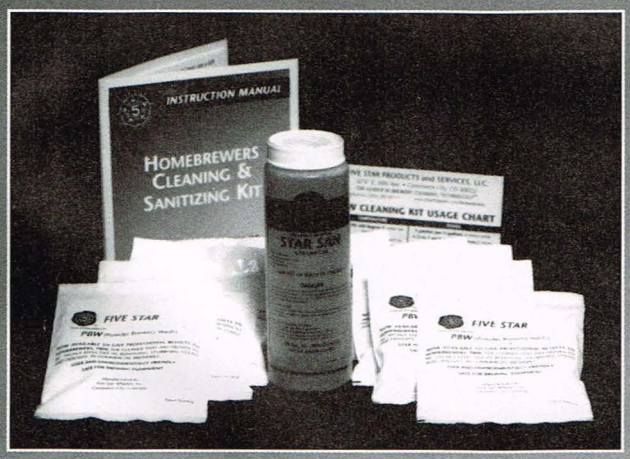
Once you pitch, Gilson recommends aerating your wort. "This gives the yeast the oxygen they need to reproduce and build more cells," he explains. Gilson uses an electric fish pump with a sterile hose for this procedure.

Snake River Brewing Co. is located at 265 South Millward, Jackson, Wyo. 83002. (307) 739-2337. Or visit the brewery online at www.snakeriverbrewing.com. ■

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12 Tricks Pros Use

BY ARTIE TAFOYA

1 Scrub-a-Dub-Dub

In training assistant brewers I have found that there is a big difference between cleaning and scrubbing. Each and every item that comes into contact with your wort/beer should be cleaned with cleaning solution. Make sure you hit every crack and crevice, using a toothbrush or other small brush to reach those areas. Cosmetic cleaning is not sufficient; when I talk about cleaning I mean real elbow grease. If you get lazy in cleaning, your beer will suffer.

2 Give It a Bath

Hot water sanitization is one of the easiest and smartest things a homebrewer can do. After cleaning, submerge all items that come in contact with the beer before and after brewing in 180° F water for 10 minutes. This will eliminate 99.9 percent of beer-spoiling bacteria. It is especially important for hoses and other plastic items. There are many sanitizing products on the market, but hot water can eliminate most chemicals from the sanitization process. Hot water sanitization also eliminates chemical waste.

I advise against using bleach. It is very difficult to rinse, even at low dilutions. Several vigorous washes may clean out the majority of bleach, but a thin film may still linger. This thin film can then lead to off-flavors in your beer.

3 Mash for Flexibility

When extract brewing, you are held captive by whatever the producer puts in the can. You can produce quality homebrews with extract. However, as it becomes more important that your beers

PRO BREWER ARTIE TAFOYA, BREWMASTER AT APPALACHIAN BREWING CO., SHARES SOME SIMPLE BREWING SECRETS

CHRISTINE KELL


1 2 3 4 5 6 7 8 9 0

emulate classic styles, the ability to make adjustments of one-fourth to one-half pound of grain becomes absolutely vital. You should be able to detect how an adjustment of one-half pound of crystal malt at 60° Lovibond vs. 80° Lovibond will change the color and flavor of your mash. Proper documentation will help track this experimentation.

With extracts it is very difficult to make adjustments because you have no idea what malts were used in the production of any given extract. Mashing is more time intensive but is not as difficult as some people would have you believe.

4 Stay on Target

One of the more difficult aspects of mashing is hitting your target temperature for conversion. Your mash-in water must be hot enough that when you mix with the (cool) grain you will hit the target temperature.

Each mash vessel is different, but as a rule of thumb start with water 10 degrees above your target temperature with a semi-dry mash. You can then adjust by adding hot or cold water to hit the proper temperature. Once you find the proper temperature of mash-in water, you will be able to hit your target temperature consistently.

5 A Little Water Never Hurt

Keep in mind that a mixable mash with a slight bit of water above the mash bed will give you good consistency required to perform the conversion of the starches to sugar. Once the liquid on top of the mash bed clears, it is a good sign that the mash is converted.

To check conversion you can perform an iodine test: Add a drop of tincture of iodine to a drop of cold wort on a white saucer. If it stays brown, conversion is complete. A blue color means starch is present and the mash should continue.

6 Make One Thing Perfectly Clear

Irish moss in the boil along with a vigorous stirring session at the end of the boil is a match made in heaven for clarifying beer. When I homebrewed I added Irish moss with 20 minutes left in the boil. At the very end of the boil, I turned off the heat and gave the beer a vigorous circular stir to create a whirlpool effect in the pot. I then covered the beer and let it sit for about 30 minutes.

As long as the wort temperature stays higher than 180° F (which should not be a problem with the lid on), the risk of bacterial contamination is greatly reduced. When removing the wort from the pot, siphon it off the top of the trub. You may have to leave some beer behind, but a reduction in the amount of trub in your fermenter will lead to a better beer — especially because most homebrewers do not have the ability to remove the cold break in the fermenter.

Hop bags are an excellent way to reduce the hop particulate in the wort. The rest of the trub will be mostly protein, but the smaller particles will still get through the bag and you still may want to keep it out of the fermenter if possible.

7 Hot Things Hot, Cold Things Cold

The most important thing about a heat-exchange system is that it be the proper size for the amount of wort you are trying to cool. If you can't cool your wort in 30 minutes or less, you really don't have an effective heat-exchange system. The rule is the same whether you are using a store-bought heat exchanger or submerging a pot in an icebath sink. If it takes more than 45 minutes, you risk the possibility of contamination.

If you are using an ice bath, you can cool while the beer is settling. If you are using an in-line heat exchanger, it is best to let the beer settle prior to the transfer to the fermenter.

8 Let It Breathe

Oxygenation of the wort prior to fermentation is crucial for proper fermentation. You most likely do not have the ability to inject sterile O_2, as we do at the brewery, but you can get sufficient oxygen into suspension. Vigorously splashing the wort into the fermenter prior to adding the yeast and rocking the closed fermenter for 10 minutes will give you about the best oxygenation possible on a homebrew level. Do not compromise your sanitation to reach ultimate oxygenation, but keep in mind the importance of giving yeast its initial energy for fermentation.

9 Fresh, Fresher, Freshest

The best place to get yeast is from a clean, recently produced batch of beer. A live culture is quite active and should lead to primary fermentation in a few hours. If you must rely on a homebrew shop for yeast, choose liquid over dry. Liquid yeast provides more variety in taste and tends to deliver a better fermentation.

It is important to make a yeast starter (one or two days before brewing) and to pitch the starter when the fermentation has reached high kraeusen, the point at which it is bubbling rapidly and there is a full head on the wort. The wort used to start the yeast should be similar in color and original gravity to the beer into which you are pitching. Also, remember to oxygenate the wort during transfer to the fermenter for optimum yeast performance.

10 Take a Second

Although it is not entirely necessary, secondary fermentation could mean the difference between a good and a great beer. After primary

fermentation is complete, you should siphon your beer into a secondary fermenter. Letting the beer sit on the residual trub and yeast over time will negatively affect the beer. Eliminating the opportunity for off-flavors in your beer is the safest path to take.

I recommend a primary fermentation of three to five days for ales and five to seven days for lagers as parameters for use with a viable yeast from a starter. You must make sure your fermentation is complete and the yeast is not lagging behind prior to pulling the beer off into secondary. Once in secondary fermentation the beer should rest for several days before you begin stepping it down in temperature for cold conditioning.

11 Cool Down

A cool-down period allows your beer to clarify and condition quicker. For a homebrewer, the best thing to do is ferment the beer, transfer it to secondary fermentation, and find the coolest spot in your house to store the beer. Optimal conditions would be a refrigerator where the temperature could be gradually dropped to approximately 36° F over four or five days. The fermenter then could be stored for a week or more. If you are cold conditioning, remember to bring the beer back to room temperature (for approximately one or two days) before adding liquefied priming sugar or malt extract for bottling.

For those brewers concerned about storing in a room that is too cold, I've found that lower conditioning temperatures offer better clarification and conditioning, but it is detrimental to the beer if it freezes.

12 Pumping the Primer

As long as you are brewing a similar kind of beer when you are ready to bottle, siphoning eight ounces of wort from the fermenting beer at 8° Plato (1.032 specific gravity) will serve as the perfect primer for the beer you are bottling. The amount of priming relies on a few factors, including cell count in the fermenting batch, cell count in the batch to be bottled, and the actual gravity of the priming wort. I have found that eight to 16 ounces works properly for a five-gallon batch. You may have to adjust the amount, but in a few batches you should be dialed in.

It is important that all hoses are properly sterilized and the beer to be bottled is at room temperature when adding the wort. If this is not an option, dry malt extract makes a very good primer. In a few weeks you should have some very good beer. As you improve this technique, every batch should continue to get better.

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CHOOSE THE

BY CRAIG HARTINGER

A beer kit is a complete recipe for one batch of beer, packaged for convenience and designed to be easy to use. Keeping one on hand means always being ready to brew. (Maybe Americans have a cultural fear that someday, somehow, Prohibition could return and leave us all high and dry: "Dang it. I for one will be safe during Prohibition II!") A beer kit in the basement does kindle a warm glow in the heart of the brewer, indeed.

Beer kits can produce beautiful homebrews, including some styles that would otherwise be very difficult for most homebrewers to achieve. The companies that produce the kits have access to complicated mashing





RACHEL PERLS

RIGHT KIT

regimens, high-tech brewhouses, hard-to-find specialty grains, and classic ingredients that might be too time consuming or unavailable to many homebrewers.

Canned Kits

The familiar three- to four-pound cans with plastic tops containing yeast are one of the easiest ways a homebrewer can make great beer. Those cans you see without a plastic top are often unhopped extract to which the brewer must add hops and yeast. Even if the can contains hopped extract, it is not really a "kit" unless it includes yeast. The label will clear up any doubts you may have.

Malt extract in these kits comes from wort made with proper specialty grains and base malt for the style and hops for bitterness. Dry brewing yeast and instructions are included. The kits are made from hopped wort that is concentrated by being heated under reduced pressure (which lowers the boiling point) then aseptically packaged in a steel can. To use these kits, the homebrewer mixes the contents with hot water in the fermenter, adds cold water to the mixture (wort), and adds the yeast. (Some kits call for boiling the wort before cooling and transferring to a fermenter.) After fermentation the beer is bottle conditioned or kegged.

These kits were first produced by UK manufacturers (although they are now made in other countries, notably the United States, Canada, Belgium, and Australia).

Read the kit instructions carefully. Don't assume the kit makes five US gallons. It may be a "24 UK pint kit" (29 US pints, or about 3.6 gallons) or even a "12 UK pint kit" in the case of strong beers.

With a bit of calculator work, homebrewers can use multiple cans or add dry malt extract to brew any gravity in any volume. Dry malt extract, sometimes called "spray-malt," is identical to malt extract syrup, except it has been dried to powder. It's easy to measure and has a long shelf life. When making additions to increase gravity, remember that one pound of malt extract in syrup form will add about .008 to the original gravity of a five-gallon batch; one pound of dry malt extract will add about .009 OG to five gallons of wort.

For example a 3.3-pound kit with the recommended 2.2 pounds of dry malt extract added would result in a wort OG of about 1.046:

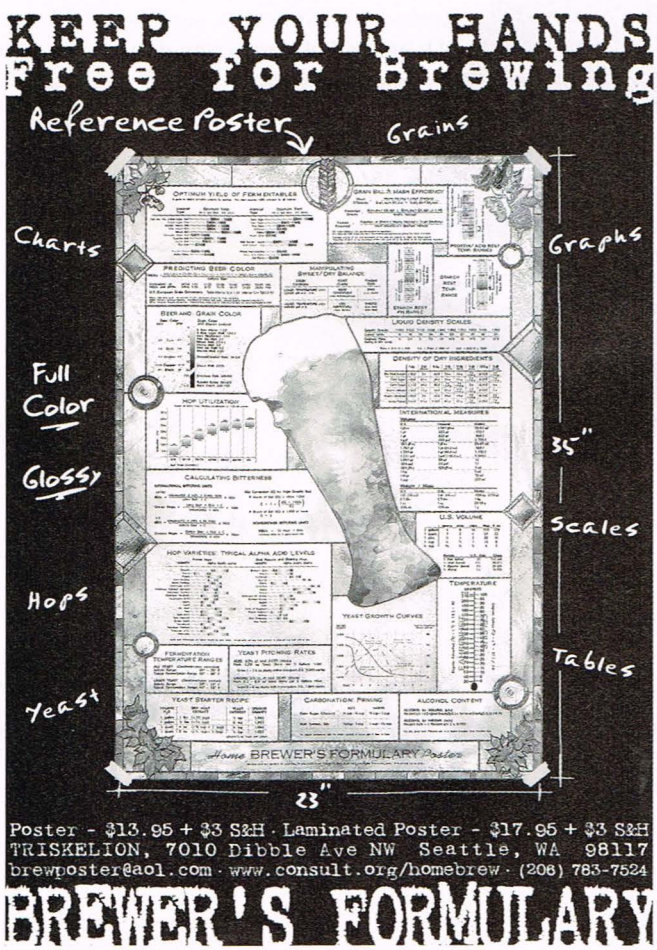
3.3 x .008 = .026
2.2 x .009 = .020
.026 + .020 = .046 (wort OG of 1.046)

Incidentally, halving the liquid volume will double the gravity yield, meaning that a three- to 3.3-pound kit is just about right for the 2.5-gallon batch size of some "beer machines."

Wort Kits

A newer development in recent years, these kits are hopped wort that has not been concentrated into syrup or is only slightly concentrated. These wort kits are often called "all-grain," "high-gravity," or "all-malt concentrated" wort kits. The producer mashes, lauters, and boils with hops a high-gravity wort, which is then packaged in a heavy plastic bag, surrounded by a sturdy box. The homebrewer just adds a small amount of water — perhaps 20 percent of the total volume — and ferments the beer without boiling at home.

The advantage to this variety of kit is that the wort is less processed, and caramelly flavors that result



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from reducing the wort down to syrup are minimized.

These kits sometimes do not include yeast, allowing the brewer to customize the beer by choosing a specific yeast strain. The kits often do add fining agents (to help clarify the beer), and sometimes chemicals to adjust pH or water hardness. Detailed instructions are also included.

Extract-and-Grains Kits

Many retailers and wholesalers assemble their own kits. Generally, these kits are high in quality and include everything you need to brew an excellent extract-with-specialty-grains beer.

A typical kit includes an all-malt recipe (no sugar added) with a blend of different extracts; blends of pre-measured specialty grains; multiple hop additions with different hop varieties for bittering, flavoring, and aromatics; clarifier; priming sugar; and good-quality brewing yeast.

A porter kit, for example, might include amber and dark dry malt extract; black barley, black patent, and chocolate malt for steeping; Cluster hops for bittering, Cascade for flavor, and Tettnanger for aroma; two packs of ale yeast; and three-quarters cup of priming sugar.

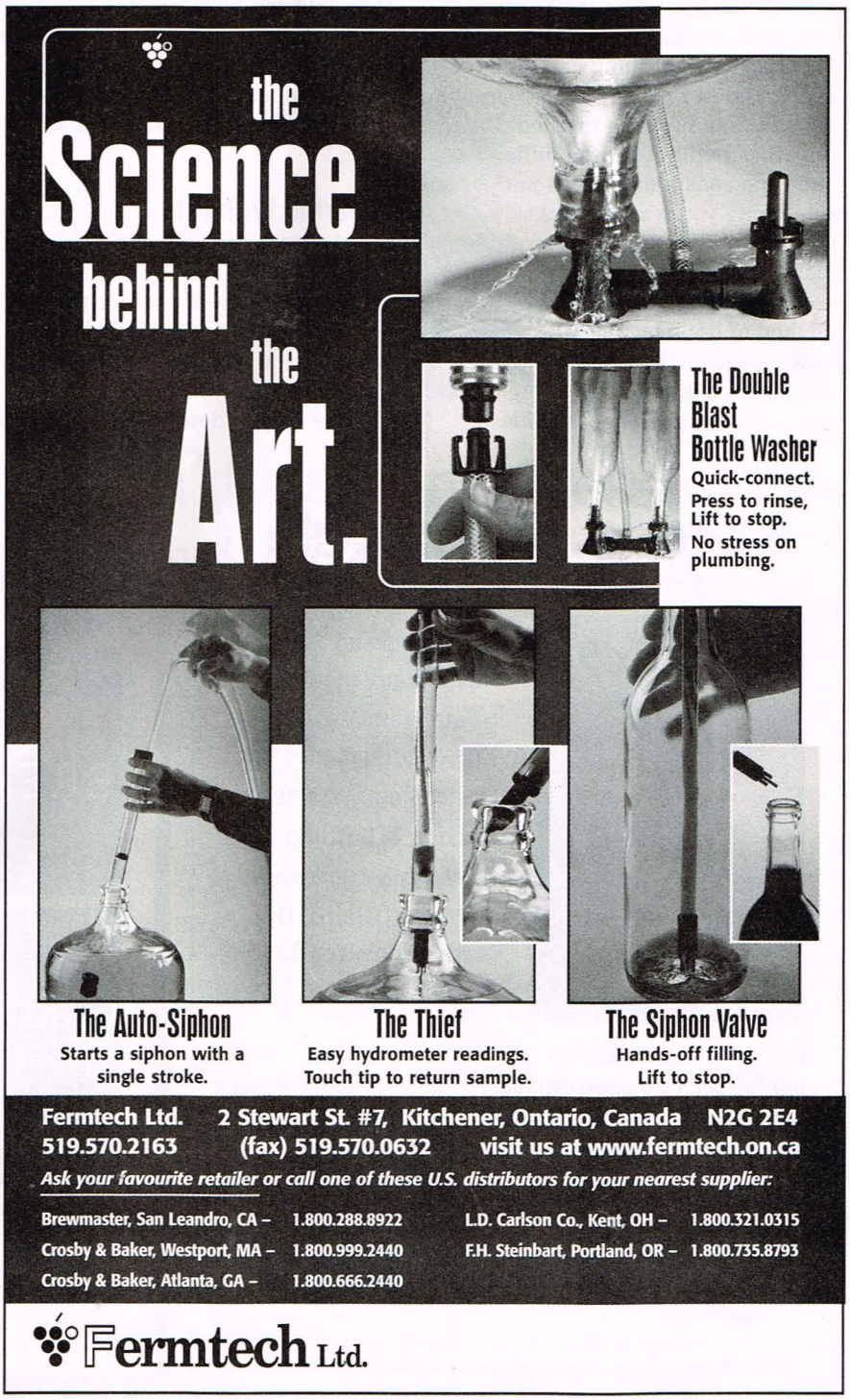
Because these kits include extract, grains, hops, and complete instructions, they are a good "next step" for extract brewers, introducing you to steeping grains and personalizing your beer with hop additions.

Tips for Choosing a Kit

If you're a first-time brewer or even a second- or third-time brewer, consider selecting a malty or hoppy style for your brew. Believe it or not, lighter beers such as American lagers and Czech pilsners are the most difficult styles to brew. That's because when the flavor is subtle, any off-flavor will have a dramatic effect. But bold beers such as porters, stouts, and IPAs mask minor flaws with powerful malt and hops taste.

Some nice, malty styles to start with include brown ale, Scottish ale, porter, and stout. Hoppy styles include pale ale, IPA (India pale ale), and English bitter. Note, however, that if you use a pre-hopped kit, you may need to add hops anyway to get the bitterness you desire. Ask your retailer about individual kits.

One nice thing about kits is the variety available on the market, from Belgian abbey-style ales to German-style doppelbocks. While it's tempting as a beginning brewer to brew a different style every time — and there's nothing wrong with that — consider making the same style two or three times in a row. This will help you compare the various batches and perfect your technique before moving on to



additional challenges.

Difficult Styles Made Easier

Another advantage of kits is that they make difficult styles easier to brew. These include styles with complex mashing methods or other special requirements. For instance you may not want to go through the trouble of a German-style decoction mash. With this method the mash is separated and parts of it are boiled and returned to raise the temperature of the remaining mash.

Decoction mashing can be interesting and fun because you recreate a traditional brewing method. On the other hand, it can be difficult and time consuming. If it's not something you want to tackle, why not let the kit manufacturer do the mashing for you?

Likewise, if your standard method of brewing includes using base extract and then steeping specialty grains, kits can give you access to a wider variety of possibilities. Certain grains can't be converted (the starches broken down into simple sugars) by steeping, so they must be mashed to be used effectively. The rule of thumb is that if it's a lightly colored grain, mash it. Pale, Vienna, Munich, pilsner, ESB, and dextrin malts, for example, must be mashed. If you want to use a style that requires these grains, you must do a partial mash or use a kit. Crystal malts and darker malts such as chocolate can be steeped.

Some difficult styles made easier by kits include barelywine, English bitter, doppelbock, Belgian beers such as abbey-style ales, and wit beer.

Lagering With Kits

Many kits make lager styles, but if you want to make a true lager, double check the kit before you buy. Lager styles should include lager yeast, which must be fermented cooler than ale yeast.

One way to determine whether your kit has true lager yeast is to check the directions. Does it recommend primary fermenting between 39° and 45° F? Then you may have true lager yeast. Do the directions tell you to ferment between 59° and 68° F? Then the kit includes ale yeast.

The problem is that most dry lager yeasts are not particularly pure. In the majority of cases, to get a true lager you'll have to buy a liquid lager yeast from your retailer. Ask him for recommendations. On the other hand, it's okay to use the dry yeast that comes with the kit. Just be aware that the beer you're getting, while it may taste fine, isn't quite to style.

Freshness Counts

Among the most important factors in the quality of beer a kit makes is the freshness of the kit. Just as beer is best when it's fresh, kits make the best beer when they are fresh. Check the can or box for

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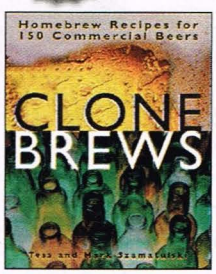
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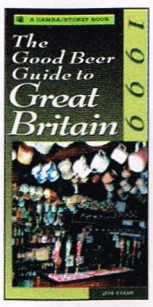
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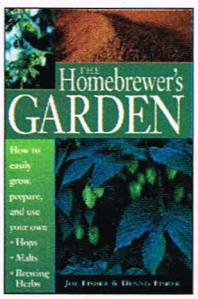
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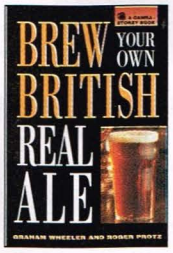
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CIRCLE 59 ON READER SERVICE CARD

a freshness date. Sometimes the dates are imprinted on the bottom of the can and intended only for the retailer so he can rotate his stock. If you're not sure, ask the retailer to double check that what you're getting is fresh.

Also, be sure to check the yeast packet for freshness. Don't use yeast beyond its printed freshness date.

Kit-Use Tips

Kits are easy to use and can make good beer. However, there are some simple things you can do to assure the quality of your homebrew from a kit.

• **Consider boiling the wort.** Even kits that do not recommend a boil will benefit from it, because a boil will kill any airborne bacterial contaminants that may have found their way into the wort. If you are adding the extract to boiling water, remove the pot from the heat, add the extract, and then stir well before returning the pot to the heat. You must be careful not to scorch the heavy syrup on the bottom of the brew kettle.

You can choose not to boil, especially because many kit manufacturers have gone to some trouble to add hop aroma to the kits. But if you don't, it's crucial to be scrupulous about sanitation.

• **Use a large pot.** Using the largest kettle and water volume possible will be good for the beer. The extract will dissolve better, and chances for scorching the wort are reduced.

• **Warm the can of extract before using.** The extract syrup will pour from the can better if it is preheated in hot water. Once it has dissolved fully, the action of the rolling boil makes further stirring unnecessary.

• **Use dry malt extract to boost gravity.** The producers of beer kits sometimes suggest the addition of "sugar, preferably brewer's sugar" (meaning corn sugar, which is dextrose) to provide appropriate fermentables for a five-gallon batch. This is the least expensive way for a homebrewer to give the wort a gravity boost, but using the same measure of dry malt extract instead of sugar will provide a more full-bodied, maltier beer. Large additions of dextrose will add alcohol but little flavor. Some tasters call the result "cidery" tasting beer.

Beer Kit Enhancements

A fine beer can result from any style of kit, as long as the brewer pays attention to sanitation, brewing techniques, and freshness dates on products. For a bit of additional effort, you can enhance flavors and customize the brew in a couple of easy ways.

• **Yeast:** Dry yeast sachets included in the kits are adequate, but the availability of liquid yeast cultures opens up a world of flavor opportunities. The elusive,



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compelling taste component of most beer results from the yeast. Try a real Bavarian hefe-weizen and decide for yourself. No cloves, bananas, or bubble gum are used in these hefe-weizens, just yeast strains that produce those flavors — and those yeast strains are available in liquid cultures. Homebrewers can select "butterscotchy" (diacetyl) rich strains for authentic-tasting English style ales, clean-tasting true lager strains (although a cool ferment is required), as well as dozens of other styles and characteristics that become as esoteric as you can handle.

• **Finishing hops:** If you choose to boil your prehopped, canned kit, the volatile aromatic components of the hops are mostly driven away. You can add those aromatics back by selecting finishing hops in pellet, whole flower, or plug form and adding them at the end of the boil. Hops that are boiled for less than 15 minutes will add flavor; hops boiled less than five minutes will add a forward hop aroma. Any amount from one-fourth ounce all the way to two ounces will provide hop character in a five-gallon batch, and because of the short boil will not significantly increase the bitterness level of the beer.

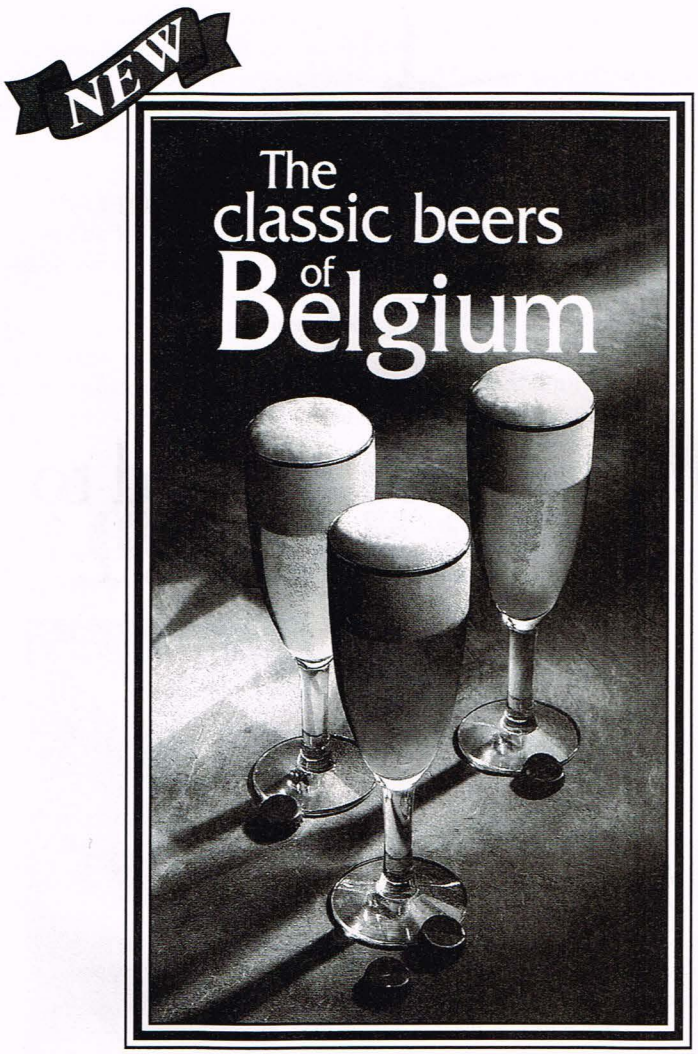
• **Dry hops:** Hops added to the fermenter are so named. Wait until the fermentation has peaked and begun to settle (because CO_2 rising through the beer will "scrub" or carry away some hop aroma). Then add one-fourth ounce or more of hops right into the fermenter.

Any form can be used, but plugs or whole flower hops contained in a steeping sack will be easiest to remove at packaging time. A couple of marbles or stainless steel bolts make good weights to pull the hop-filled sack under the surface of the beer in the fermenter, and they can be boiled together with the nylon or cheesecloth bag before going in the fermenter.

Some brewers microwave their dry hops to kill any microorganisms that may be on the hops; others count on the acidic environment of hops and ethanol in the fermenting beer to prevent contamination (and others doubt the possiblity of contamination altogether).

Yes, beer drinkers constantly gush about the stuff (sorry!) although it is only a fermented malt beverage. It compels poetry, enthusiasm. It marks the end of the brutal workday and the beginning of the relaxing evening. And what do you do when an old friend shows up at your door? Even if you're broke, victim of a nuclear holocaust, or suffering because your county went dry, you can still enthuse, relax, and quaff a beer together.

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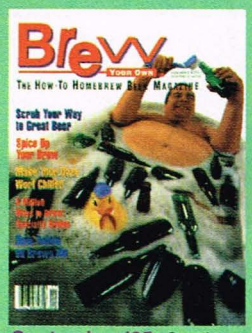
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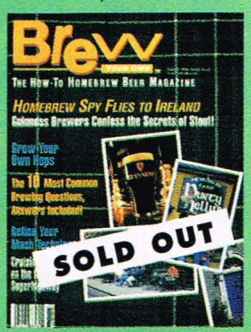
October '95 Brewing in Zero Gravity



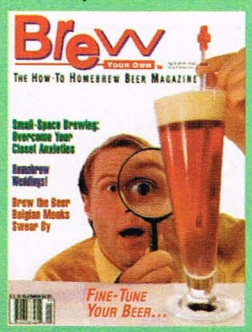
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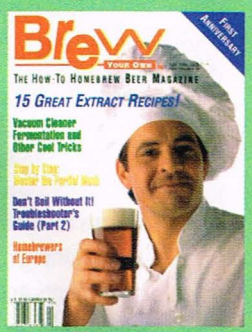
March '96 Homebrew Spy Flies to Ireland



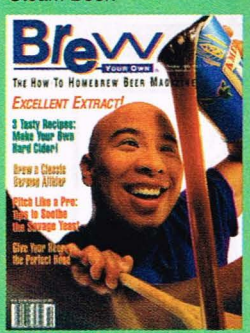
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May '96 Label Contest Winners



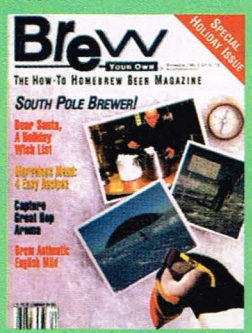
June '96 15 Great Extract Recipes



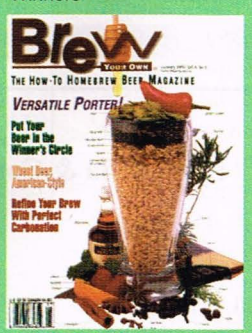
October '96 Excellent Extract!



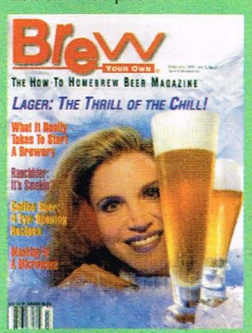
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December '96 South Pole Brewer!



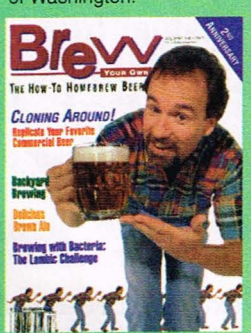
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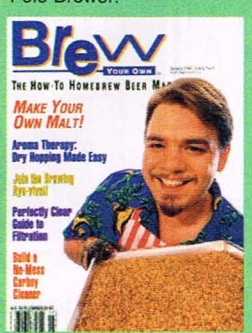
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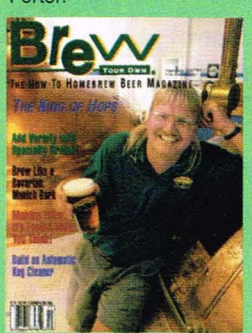
June '97 20 Great Extract Recipes



July '97 Clone Your Favorite Commercial Beer



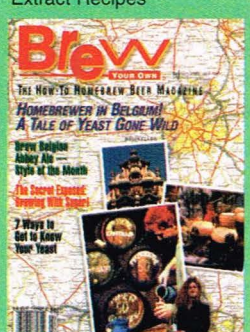
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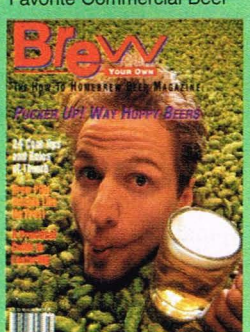
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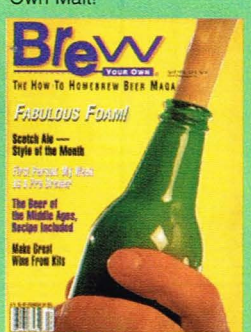
October '97 175 Great Extract Kits!



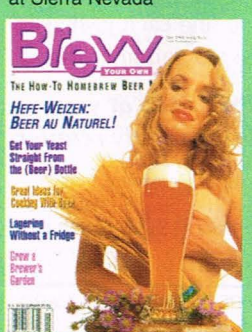
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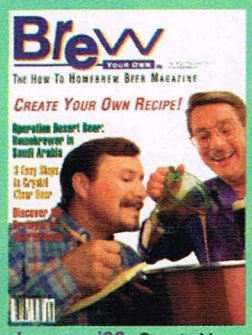
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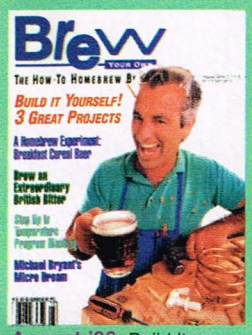
December '95 Control Beer Color



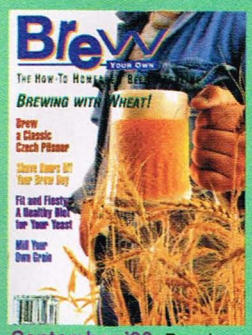
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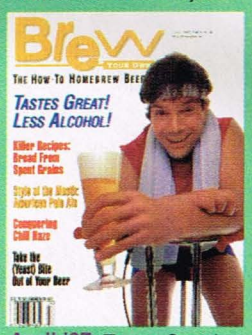
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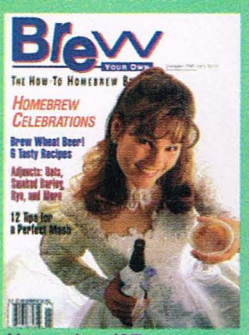
March '97 Märzen: Brew Now For Oktoberfest



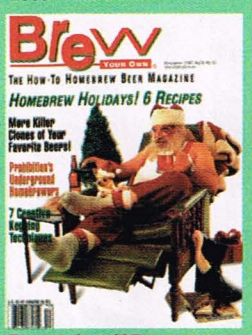
April '97 Tastes Great! Less Alcohol!



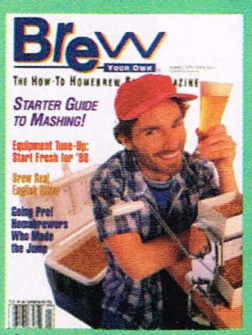
May '97 Label Contest Winners!!



November '97 Homebrew Celebrations



December '97 6 Recipes for Winter Beers



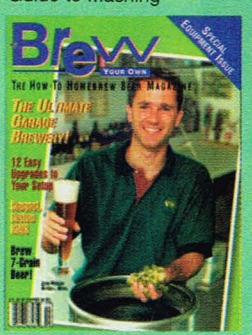
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Bock in Four Movements

From the doppelbock of 16th century monks to today's light-hearted helles, here are four popular bock beers.

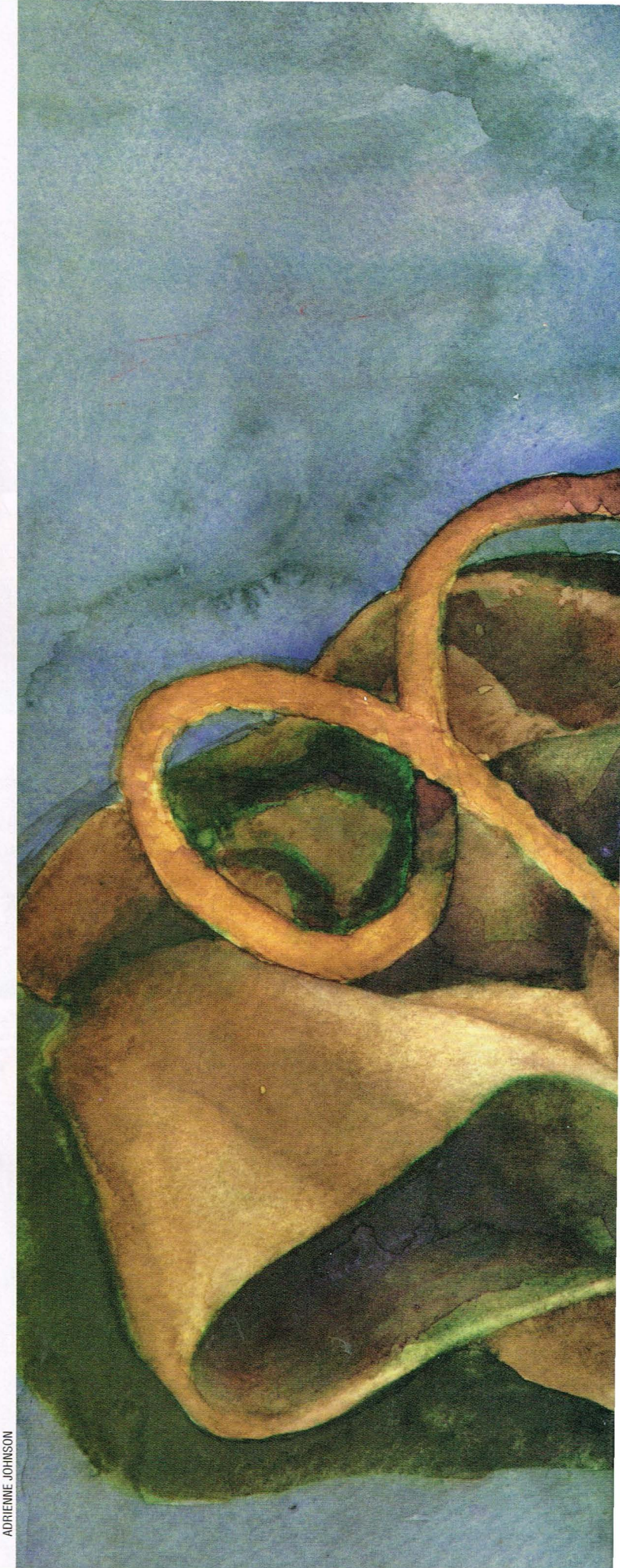
Bockbiers are steeped in tradition and have long been revered as special elixirs that evoke the start of a new season of life and of vibrant experiences.

Historically, bockbiers are strong beers of Germanic origin that date back as far as 1250 according to some records. They were originally spontaneously top fermented, dark beers made primarily of wheat. They were produced in the winter, when fermentation temperatures were accommodating, and stored for drinking in the summer.

Its name, in spite of the many goat tales (*bock* is German for goat), came from the Hanseatic League town of Einbeck, where bock was first brewed. The Hanseatic League was a trading organization formed by free cities in the late 13th century, marking all of the beer barrels with a bold H supporting a crown.

By the late 1300s Einbeck had 600 brewhouses producing the town's beer. Citizens participated in the brewing process as needed, and even the mayor of Einbeck served as the principal brewmaster. Bock was later exported in great volume to Munich and eventually proliferated all over Europe and even as far as

by Mikoli Weaver



ADRIENNE JOHNSON



the Holy land.

Eventually, trading and religious divisions between the north and south as well as the decline and fall of the Hanseatic League created a large demand for the beer in Munich. It was being imitated with fair success, but it became far more prolific after the Einbeck brewmaster was brought to Munich in 1612. The officials of Munich held him there with no chance of release, and from then on the rest of bock's history was basically made in the south.

Bock was introduced to the United States around 1840 as a spring seasonal. It gained popularity as an import and as a domesticd product until Prohibition. In 1933 when Prohibition was repealed, bock saw a short-lived renewal but eventually declined into virtual nonexistence until the 1970s. It was not until recent years, perhaps as late as 1985, that the microbrew revolution brought the style back to America.

Bock to Bock

There are many variations of the bock style. Five of the most popular include traditional bock sometimes known as dunkels bock; helles (pale); maibocks (May); weizenbock (wheat); and doppelbock, a completely different beer altogether.

Like other German beers, bocks fall under the Reinheitsgebot. This is the well-known law of purity established in 1516 by dukes Willhelm IV and Ludwig X of Bavaria stating that beer may be made of water, malt, and hops only. Yeast, of course, was allowed but not included because it was naturally occurring and little understood. The Reinheitsgebot existed in a simpler form as a law passed by Duke Albert IV in 1487.

In addition to the purity law, bocks also fall under various Munich Brewer's Guild laws that designate style guidelines to ensure consistent quality. Under these laws bocks are now all brewed with lager yeast (bottom fermenting) and are usually pale mahogany or dark copper. They must be brewed from wort of at least 16° Plato (1.064 specific gravity) and contain an alcohol by volume of 7.5 percent or higher.

Bocks have a pleasing malty character that finishes slightly sweet, showing caramel and roasted flavors. Hops for this variety are of noble type, typically from the Hallertau region of Germany, and are employed only to create balance in the beer.

The Beers of Spring

Helles bocks are light gold to light copper in color with a slightly dry finish. They exhibit little hop character, and the malt profile is similar to that of pale and lager varieties. This beer is not reflective of original bock styles, being much lighter and more delicate, somewhat like a strong pilsner.

Maibocks can be thought of as a distinct style, especially because helles varieties are sometimes produced for fall consumption. Maibocks should be a bit darker than their helles counterparts, using more caramel malts and possessing a distinctly spicier hop character. In fact it is not uncommon for maibocks in the United States to have a perceptible hop presence and aroma, although this is not the norm for most of the continental beers.

Imported versions of this style include, among others, Ayinger Maibock, a wonderfully flavorful lager exhibiting deep malt flavors and a dignified yeast flavor, and Hacker-Pschorr Bock, an all-barley-malt beer laced with abundant amounts of fragrant Hallertauer hops. The Hacker-Pschorr Bock is very pale in color with a marked dry finish.

Weizen...Bock?

During the genesis of bockbier, most brewers included some amount of wheat malt in the grist bill, and some still do today. Weizenbocks now resemble dark hefe-weizens. This beer is listed as a separate style because the Great American Beer Festival, World Beer Cup, and other competitions have a specific weizenbock category, which by accident or design creates entries in that

Style Guidelines

Style	OG	ABV	IBU	SRM	Examples
Bock	1.066-1.074	6-7.5%	20-30	20-30	Spaten Premium Bock
Helles & Maibock	1.066-1.068	6-7.5%	20-35	4-10	Thomas Kemper Maibock, Ruffian Maibock
Weizenbock	1.065-1.083	6.9-9.3%	10-15	5-30	Pyramid Wheatenbock, Aventinus
Doppelbock	1.074-1.080	6.5-8%	17-27	12-30	Ayinger Celebrator, Paulaner Salvator

** World Beer Cup style guidelines*

OG=Original Gravity, ABV=Alcohol by Volume, IBU=bitterness, SRM=color

manner. Also, there seems to be a trend in American craft bocks to include wheat, occasionally even noting it in the name.

The competition guidelines are so nebulous that virtually any beer resembling a strong wheat beer could enter and possibly win a medal. In fact their definition of weizenbock is a wheat beer brewed to bock strength. In truth, however, the two beers have completely different histories and should have different characteristics.

If you are really interested in creating a weizenbock or emulating the original Einbeck beer, try the following procedure:

1. Start with a proper strain of lager yeast, not German ale, and work from there.

2. Decide how much influence you want the wheat to have. The original Einbeck bock had 30 percent. This is sufficient. Most Bavarian wheat beers contain at least 50 percent wheat, usually upward of 60 percent. This seems like a bit of a stretch for a bock. The best thing to do is taste several brands of wheat and barley malt bocks and decide for yourself based on the evidence.

3. Choose the style you are going to create. If it is going to be a maibock, for example, then adhere to those color parameters.

This is not to completely discredit weizenbock as a style altogether, particularly when marketing is considered. It sounds pretty good; at least it has a good German resonance to it. Besides, it seems that anything with weizen in the title is still selling well across the country. This, coupled with boasting a high alcohol content, could possibly make for a popular item. Two area beers exemplifying a traditional idea of the style are Pyramid's Wheatenbock, which had a fair amount of success during its run, and Scuttlebutt's Weizen Bock, which had a good showing at a local Oktoberfest. And, interestingly enough, the Back Bay Brewing Co. in Boston won a GABF bronze this year for its Wheat Bock in the doppelbock category.

In the Old World the style is a bit more festive. Almost all breweries have a weizenbock that is released as a strong, warming Christmas seasonal. A well-known example is the Aventinus, named after a Bavarian historian (not the Bishop of Rome as commonly thought). The Aventinus took the gold position as one of only two entries in the World Beer Cup in 1997. No silver was awarded, and the bronze went to Wild Pitch Weizenbock brewed by the Coors Sandlot Brewery. Quite a difference in those two products.

An Age-Old Monastic Gift

The background of doppelbock is quite a different matter than the rest of the beers in the family. During the Protestant Reformation



there were several Catholic monasteries established in southern Germany as Counter-Revolution period strongholds. These forts stood not only as religious bastions but as symbols of tradition.

One of these was the cloister of the Franciscans (St. Francis) from Paula, Italy. The Paulaner monks, as they were known to the Germans, would ritually brew a strong beer to carry them through the two holy fasts during Lent and Advent. The brew was a dark liquor brewed with more grain than that used for bock but not fermented as thoroughly. This left a sweet finish and lots of residual carbohydrates. The monks named it Salvator, or savior. Appropriately named because the total days fasted are 70. To this day the Paulaner brewery calls its doppelbock Salvator.

The beer was most likely made dark because the more acidic dark malts will naturally lower the pH of the mash. The water in the south was very basic, so acidifying the mash would serve to provide better conversion and a better product with more sugars. With this said, there must also have been some sort of sensory influence as well, for there is nothing like a rich and dark beer in the middle of the coldest months. Even the aroma is warming.

It seems that although the beer was produced from the 16th century, it was not introduced to the public until 1780. The people of Munich, comparing it to the immensely popular bockbiers of the time, noticed the difference in color and strength, subsequently giving it the moniker doppelbock (double bock).

During the Napoleonic wars the monasteries were shut down, but the Paulaner brewery remained in operation through other families. Several other breweries then began to copy the style, adopting the *-ator* suffix, attempting to align themselves with the Salvator they were emulating.

According to current German law, doppelbocks must have an original gravity of 18° to 28° Plato (1.074 to 1.112 specific gravity) and an end alcohol content of 7.5 percent to 13 percent by volume.

Munich Brewer's Guild laws are typically strict for this beer, stating that it may only be pitched with pure, new yeast each time and must be filtered. This information helps to lay to rest the preposterous notion that any bockbier, especially doppelbock, is created from the dregs at the end of the brewing year or from the leftover parts in the brewing vessels.

Popular imported doppelbocks are produced by Ayinger (Celebrator). This widely acclaimed beer is a dark tawny brown, almost like port in appearance. Its bold, malty flavor is delicately laced with warming alcohol, caramel, and yeast character. Spaten Optimator, another popular doppelbock, is a richly vinous drink that shows plenty of alcohol esters and fruits. EKU "28," a huge doppelbock from Kulmbach, possesses an OG of 28° Plato (1.112 specific gravity).

Bock Brewing

Malts and Mashing Techniques

Producing lager beers is not nearly as complicated as it was in the past, primarily because of advances in malting technology and to some extent mashing equipment. The malts of the Old World were poorly modified, high-protein varieties that required special handling and mashing techniques to yield the desired extraction.

Decoction mashing was one of these techniques. Mashing by fraction, or decoction, is a long and laborious process used to break down excess beta-glucans and other large proteins present in under-modified malts.

Currently, the two-row and some six-row malt varieties are low in protein and so lend themselves to single-infusion mashes. For American, Canadian, and some European malts, consider using a simple single-stage mash at 149° to 155° F. The mash should be allowed to convert for about an hour or until a starch conversion test indicates negative.

The sparge program is the same as with all other beers, about 168° to 172° F to yield 168° F water in the grain bed during run-off. Lower temperatures allow the alpha amylase enzyme to continue working, slowly breaking down dextrins, which help with body and head retention.

Temperatures higher than 170° F tend to leach polyphenols (tannins) from the husks of the malt (which is one reason the thin-husked, two-row variety is often chosen). The tannins eventually combine with proteins to form colloidal haze in the finished product. In addition to haze, there is a small flavor issue involved due to the brash tannic profile.

The Boil

Boil for 90 minutes to volatilize (vaporize) the sulfitic compounds and precipitate a proper protein break. Some brewers only boil grain beers for an hour, which works to some extent but does not sufficiently reduce the S-methyl methionine. The SMM in the kettle is the precursor to dimethyl sulfide (vegetable or corn flavor) in fermentation, and DMS is not a desirable flavor in lagers.

The half-life of SMM is 45 minutes, so a 90-minute boil helps to eliminate it, although it is true that SMM continues to form from the heat in the kettle while it sits in wait for the heat exchanger transfer into the fermenter. And of course, longer boil means concentration of flavors and better hot break (trub knock out).

Hop Varieties

As with any style, consider using the traditional hops required and spare no expense doing so. Hops in many respects make a beer, and classic styles demand care by the brewer.

For bockbiers German Northern Brewer work well as bittering hops, although Perle, Spalt, and Spalt Select are also good choices. Hallertauer is a widely accepted hop to use, as is Saaz and to a lesser extent Tettnanger. The point is to emphasize delicate noble flavors and aromas over stronger

varieties in the finished product.

Hersbrucker also works very well for finishing and middle characteristics, although not technically a true noble type. Using hop flowers during the whirlpool or in the hop back is a good way to achieve this noble character.

Remember that the role of hops in these beers should be to balance and add perhaps a small amount of aroma, no more. Bock is a study in subtlety and craft, defining an art of patience.

Yeast, Fermentation, and Lagering

Yeast selection is a relatively simple process. The main factors to consider are: 1) What flavor profile do you want from your yeast? 2) Does the strain produce the lowest levels of undesirable diacetyl? 3) Look for yeast that is capable of reproduction in high-gravity environments. 4) Look for a yeast that is as flocculent as possible to expedite lagering.

Fermentation temperature also has a major effect on diacetyl production. Higher temperatures produce more diacetyl but also reduce it more quickly. Alternately, cooler fermentation temperatures produce lower concentration but do not reduce it as much, which inevitably leads to longer storage times required to bring the diacetyl below the flavor threshold. Large amounts of sugar create lower concentrations of water outside the cell and by osmosis will draw water out of the cell, debilitating it.

Tolerance to alcohol is also important, particularly if you like your bocks big. Ethyl alcohol is a waste product of fermentation and as such is poisonous to brewers yeast. In addition to flavor maturation, the lagering process is employed to allow the yeast to settle out of suspension.

Most lager yeasts perform best at 45° F and more generally 41° to 50° F.

One program for a fermenting maibock of 17° Plato (1.068) is as follows:

1. Cool the initial wort to 45° F and oxygenate the solution well. Oxygen is crucial for the first generation of yeast to divide without scarring and for the sterols to be passed on, among other reasons.

2. Make a starter. Ample lager yeast should be pitched, in fact much more than ale yeast.

3. Allow the temperature to rise to 50° F as the yeast grows over three days and to 55° F over another three. At this time the yeast will begin to reduce some of the diacetyl and sulfitic compounds being produced. Maintain this temperature until the beer is about 5° Plato (1.020 specific gravity).

4. Cool the beer to 40° F or lower, and transfer to a conditioning vessel. Cellar until the beer has



cleared, the volatile compounds have subsided, and the gravity has reduced to 2° Plato (1.008 specific gravity) or desired balance and finish.

The final gravities can be adjusted easily according to each bock type's specifications, and in some cases it may be necessary to inactivate the yeast by colder temperatures so that a high finishing gravity can be achieved. If this method is employed, make sure that yeast is removed from the beer before bottling to avoid serious overcarbonation problems. If bottle conditioning for carbonation, you must take care to ferment well below the traditional residual sugar content. Especially a 5° Plato (1.040 specific gravity) terminal gravity doppelbock!

Water Treatment

Water chemistry can be fairly complex, and attempts to adjust some ions can lead to the corruption of others. Such is the case through the use of various softening salts. In most cases it is not necessary to worry about this. The main treatment concerns of a homebrewer are to remove any excess chlorine with an active carbon filter and, in bad cases, specially filter the water to remove some of the heavy metals and fluorides (although a small amount of heavy metals is essential for good yeast metabolism).

With that taken care of, it is time to attack an area that must be stressed, the pH of the brewing water. You can test your water and mash using pH testing strips available at homebrew retailers. Most water is pretty close to the neutral level of 7, which will raise the mash pH when mixed with the grain. The easiest way to lower the pH (acidify) is to add some $CaSO_4$ (gypsum) or, in the case of dark beers, roasted grains will naturally achieve this process.

Just remember that you want the pH of the mash to be from 5.2 to 5.3 optimum, the beginning of the boil about 5.5 to 5.7, and the post boil pH to be 5.5 or lower. During fermentation the pH of the beer will reduce to about 4.2 give or take depending on the type of beer being produced.



CIRCLE 3 ON READER SERVICE CARD

Recipes

The following recipes have been formulated for single-infusion mashing, although they will work perfectly with decoction or step mashes. Note that there will be slight differences in color and flavor, however.

Annihilator Doppelbock
(5 gallon, all-grain)

One humorous tale of bock tells of a man in old Germany brewing an exceptionally strong beer that was consumed during the spring and summer. A friend came over to sample the brew and got so drunk that he fell on his way out the door. Flat on his face, in fact. Too embarrassed to relate the truth to the gentlemen at the local pub, he blamed his condition on a kick from a goat. This beer will make you feel the same. A variety of caramel and roasted grains will lend great depth and interest to the finished product.

Ingredients:

- 10 lbs. pale pilsner malt
- 2.5 lbs. Munich malt
- 1 lb. cara-pils or dextrin-type malt
- 1.5 lbs. carastan or pale caramel malt, 20° Lovibond
- 2 lbs. crystal malt, 60° Lovibond
- 1 lb. pale chocolate malt, 170° Lovibond
- 0.75 oz. Perle hops (7.3% alpha acid) for 90 min.
- 1 oz. Hallertauer hops (3.7% alpha acid): 0.5 oz. for 30 min., 0.5 oz. at end of boil
- Wyeast 2206 (Bavarian lager)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grains in 5.5 gal. water in a single infusion at 150° F for 60 min. Sparge with 170° F water to collect 5.5 gal.

Total boil is 90 min. At start of

boil, add Perle hops. Boil 60 min. and add 0.5 oz. Hallertauer hops. Boil 30 min. more and add 0.5 oz. Hallertauer hops. Chill to 45° F and pitch yeast in a starter.

Ferment at 45° F for three days. Raise to 50° F for three days. Raise to 55°. Rack into secondary when gravity reaches less than 1.020. Cool to 40° F and ferment to 1.008 (about three more days). Age at 40° F until clear (seven to 14 days). Bottle and prime. Condition in the bottle as long as desired (30 to 60 days)

Doppelbock
(5 gallons, extract with grain)

Ingredients:
- 10 lbs. light malt syrup
- 1 lb. cara-pils or dextrin malt
- 1.25 lbs. crystal malt, 60° Lovibond
- 1 lb. pale chocolate malt, 170° Lovibond
- 1 oz. Perle (7.3% alpha acid) for 60 min.
- 1 oz. Hallertauer hops (3.7% alpha acid): 0.5 oz. for 30 min., 0.5 oz. at end of boil
- Wyeast 2206 (Bavarian lager)
- 2/3 cup corn sugar for priming

Step by Step:

Start with 5 gal. of water. Crush grains and steep in water at 150° F for 30 min. Rinse the grain with enough water to make 5.5 gal.

Total boil is 60 min. Heat to a boil and add Perle hops. Boil 30 min. Add 0.5 oz. Hallertauer hops. Boil 30 min. more and add 0.5 oz. Hallertauer hops. Chill to 45° F and pitch yeast in a starter.

Follow the fermenting schedule for the all-grain recipe.

Maibock
(5 gallons, all-grain)

Ingredients:
- 9 lbs. pilsner malt
- 1.5 lbs. Munich malt
- 0.75 lb. carastan or pale caramel, 20° Lovibond
- 0.5 lb. crystal malt, 60° Lovibond
- 0.5 lb. cara-pils or dextrin-type malt
- 0.75 oz. German Northern Brewer hops (8.5% alpha acid) for 90 min.
- 0.5 oz. Hallertauer (3.7% alpha acid) for 30 min.
- 1 oz. Saaz (3.1% alpha acid) at end of boil
- Wyeast 2124 (Bohemian lager)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grains in 3.8 gal. water in a single infusion at 150° F for 60 min. Sparge with 170° F water to collect 5.5 gal.

Total boil is 90 min. At start of boil, add Northern Brewer hops. Boil 60 min. and add Hallertauer hops. Boil 30 min. more and add Saaz hops. Chill to 45° F and pitch yeast in a starter.

Ferment at 45° F for three days. Raise to 50° F for three days. Raise to 55°. Rack into secondary when



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gravity reaches less than 1.020. Cool to 40° F and ferment to 1.008 (about three more days). Age at 40° F until clear (seven to 14 days). Bottle and prime. Condition in the bottle as long as desired (30 to 60 days).

Maibock
(5 gallons, extract with grains)

Ingredients:

- 8.5 lbs. light malt extract
- 0.5 lb. Munich malt
- 1 lb. cara-pils or dextrin malt
- 0.75 lb. crystal malt, 60° Lovibond
- 1 oz. German Northern Brewer hops (8.5% alpha acid) for 60 min.
- 0.5 oz. Hallertauer (3.7% alpha acid) for 30 min.
- 1 oz. Saaz (3.1% alpha acid) at end of boil
- Wyeast 2124 (Bohemian lager)
- 2/3 cup corn sugar for priming

Step by Step:

Start with 5 gal. of water. Crush grains and steep in water at 150° F for 30 min. Rinse the grain with enough water to make 5.5 gal. Total boil is 60 min. Heat to a boil and add Northern Brewer hops. Boil 30 min. Add Hallertauer hops. Boil 30 min. more and add Saaz hops. Chill to 45° F and pitch yeast in a starter.

Follow the fermenting schedule for the all-grain recipe.

Traditional Einbeck Bockbier
(Dunkels Bock)
(5 gallons, all-grain)

Ingredients:

- 9 lbs. Munich pale
- 3 lbs. wheat malt malt
- 1 lb. crystal malt, 60° Lovibond
- 0.5 lb. black malt
- 0.5 oz. German Northern Brewer hops (8.5% alpha acid) for 90 min.
- 0.75 oz. German Brewer's Gold hops (4.8% alpha acid) for 30 min.
- 0.5 oz. Hallertauer hops (3.7% alpha acid) at end of boil
- Wyeast 2206 (Bavarian lager)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grains in 4.25 gal. water in a single infusion at 149° F for 60 min. Sparge with 170° F water to collect 5.5 gal.

Total boil is 90 min. At start of boil, add Northern Brewer hops. Boil 60 min. and add Brewer's Gold hops. Boil 30 min. more and add Hallertauer hops. Chill to 45° F and pitch yeast in a starter.

Ferment at 45° F for three days. Raise to 50° F for three days. Raise to 55°. Rack into secondary when gravity reaches less than 1.020. Cool to 40° F and ferment to 1.008 (about three more days). Age at 40° F until clear (seven to 14 days). Bottle and prime. Condition in the bottle as long as desired (30 to 60 days).

Einbeck Bockbier
(5 gallons, extract with grains)

Ingredients:

- 8 lbs. light malt syrup
- 2 lbs. wheat malt syrup
- 1 lb. crystal malt, 60° Lovibond
- 0.5 lb. black malt
- 0.75 oz. German Northern Brewer hops (8.5% alpha acid) for 60 min.
- 0.75 oz. German Brewer's Gold hops (4.8% alpha acid) for 30 min.
- 0.5 oz. Hallertauer hops (3.7% alpha acid) at end of boil
- Wyeast 2206 (Bavarian lager)
- 2/3 cup corn sugar for priming

Step by Step:

Start with 5 gal. of water. Crush grains and steep in water at 150° F for 30 min. Rinse the grain with enough water to make 5.5 gal. Total boil is 60 min. Heat to a boil and add Northern Brewer hops. Boil 30 min. Add Brewer's Gold hops. Boil 30 min. more and add Hallertauer hops. Chill to 45° F and pitch yeast in a starter.

Follow the fermenting schedule for the all-grain recipe.

Aventinus Weizenbock
(5 gallons, all-grain)

Ingredients:

- 7.25 lbs. wheat malt
- 6 lbs. Munich two-row

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- 0.3 lb. chocolate malt
- 1.25 oz. Hallertauer hops (3.7% alpha acid): 1 oz. for 90 min., 0.25 oz. at end of boil
- Wyeast 2206 (Bavarian lager) or 3333 (German wheat)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grains in 4.25 gal. water in a single infusion at 152° F for 60 min. Sparge with 170° F water to collect 5.5 gal.

Total boil is 90 min. At start of boil, add 1 oz. Hallertauer hops. At end of boil add 0.25 oz. Hallertauer hops. Chill to 45° F and pitch yeast in a starter.

Ferment at 45° F for three days. Raise to 50° F for three days. Raise to 55°. Rack into secondary when gravity reaches less than 1.020. Cool to 40° F and ferment to 1.008 (about three more days). Age at 40° F until clear (seven to 14 days). Bottle and prime. Condition in the bottle as long as desired (30 to 60 days).

*Note: To employ a step mash, the real Aventius employs a rest at 128° F and is stepped up to 152° F with hot water.

Aventinus Weizenbock
(5 gallons, extract with grains)

Ingredients:

- 5 lbs. wheat malt syrup
- 5 lbs. light malt syrup
- 0.3 lb. chocolate malt
- 1.25 oz. Hallertauer hops (3.7% alpha acid): 1 oz. for 60 min., 0.25 oz. at end of boil
- Wyeast 2206 (Bavarian lager) or 3333 (German wheat)
- 2/3 cup corn sugar for priming

Step by Step:

Start with 5 gal. of water. Crush grains and steep while heating water for 15 min. Rinse the grain with enough water to make 5.5 gal. Total boil is 60 min. At start of boil, add 1 oz. Hallertauer hops. At end of boil add 0.25 oz. Hallertauer hops. Chill to 45° F and pitch yeast in a starter.

Follow the fermenting schedule for the all-grain recipe.

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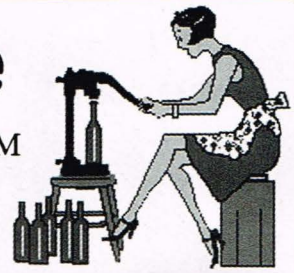
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Mikoli Weaver is brewmaster at Woodland Brewing Co., Seattle.

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The Art of HOLIDAY & SEASONAL BREWING

by Keith T. Yager

I brought along a few bottles of something I simply call Stock Ale to the monthly poker game several weeks ago. It's an easy beer brewed in a few hours from a partial-mash recipe. It's the kind of beer I brew to keep my refrigerator stocked. It tastes good. It matures quickly. It keeps me out of the grocery store at 1 a.m. looking to spend $7 on a six-pack.

I was in the hole a couple bucks and looking at another lousy hand when the guy with most of my quarters said, "This is a great beer, man!"

"No, it's not," I said as I folded my hand miserably.

Like all homebrewers I take my beer way too seriously. Plus, I'm a



sore loser. But what my cheating friend doesn't understand is there's a difference between ordinary beer and Great Beer. An ordinary beer is something you casually pour down your throat when the football game is on. It's prepared for everyday, ordinary occasions. On the other hand, a Great Beer is imbibed only occasionally. It is carefully prepared with an event in mind, whether it's a Fourth of July barbecue or a cheerful Christmas eve gathering. Great Beers are anticipated. They are celebrated. They enhance the flavor of life like fine imported spices.

Homebrewers have the opportunity to offer rare gifts to their families and friends by presenting their most special beers during these occasions. With control over choice ingredients, extended agings, and extremely limited releases, homebrewers can — perhaps — create the Greatest Beers.

Planning

A few years ago I wanted to brew a spiced strong ale for Christmas. I planned the beer in

October, ordered my ingredients, and brewed in November. By the time I was bottling, Christmas was only 20 days away.

The beer was opened on Christmas eve and tasted green and overwhelmingly aggressive. Everybody took a small sip or two and with puckered faces said, "Yeah. It's...interesting." I was pouring full glasses down the sink before 10 p.m.

I held on to the batch and later that April sampled it with trepidation. The beer was fantastic. The spiciness had blended with the complex, fruity esters. The hotness of the alcohol had mellowed.

Unlike ordinary beers, which are brewed arbitrarily and opened when they reach fruition, Great Beers must be created and opened on a specific date to allow adequate aging time. They should be allowed to age until their peak falls around the targeted event. In some instances this can be six months to a year or more.

Calendars are invaluable brewer's tools. By scheduling the opening dates for beer, weeks and months can be counted backward to brewing dates. This ensures that in May or June, when you're not thinking about holly and mistletoe, you will be thinking about brewing that Christmas ale that is going to need some time in the bottle to reach its peak.

Controlling Quality

You know that lager you brewed last weekend? The one you stayed up with until 2 a.m.? It's happened to me before, too. I got started late, so I skipped the decoction mash. I picked up my yeast Wednesday, so it swelled just in time to make a small six-ounce starter. I relaxed a little too much and had a couple homebrews too many. Suddenly I'm rubbing my eyes, yawning, and thinking about skipping trub removal. Great Beers require complete attention to detail. This is best achieved by brewing in the morning.

New Harvest Moon Oktoberfest Lager
(5 gallons, all-grain)

Ingredients:
- 8 lbs. German or Belgian pilsner malt
- 1.5 lbs. toasted malt (or victory)
- 1.5 lbs. Vienna malt
- 0.5 lb. dark crystal malt
- 0.5 lb. light crystal malt
- 1 oz. Hallertau Hersbrucker hop pellets (4.3% alpha acid) for 60 min.
- 0.5 oz. Saaz whole hops (3.6% alpha acid) for 30 min.
- 3/4 gal. Munich or Bavarian lager yeast starter

Step by Step:

Toast 1.5 lbs. of German or Belgian pilsner malt at 300° F for 20 to 30 min. until inside is beige-orange. Cool. Mash in 3.5 gal. 130° F water. Acid rest at 122° F for 30 min. Raise heat to 152° to 155° F and rest for 60 min. Mash out at 168° F. Sparge with 170° F water. Collect 5.5 gal.

Total boil is 60 min. Add Hersbrucker hops. Boil 30 min. and add Saaz hops. Boil 30 min. more. Chill and pitch yeast at 75° F.

Ferment at 52° to 55° F for 10 to 14 days. Keg. Slowly drop temperature to as close to freezing as possible (without freezing), and lager for three to six months.

OG = 1.065

Partial Mash Version:

Substitute 7 lbs. dry malt extract or 8.5 lbs. extract syrup for the pilsner malt. Place cracked specialty grains in a grain bag and steep in 1 gal. of water at 155° F for 30 min. Rinse grain bag with 2 gal. water at 165° F. Top up to 5.5 gal. and add extract as you bring to a boil. Stir often.

Winterfest Celebration Ale
(5 gallons, all-grain)

Ingredients:
- 11 lbs. two-row malt
- 0.5 lbs. medium crystal malt
- 6 oz. chocolate malt
- 1 lb. honey
- 2 to 3 oz. fresh ginger
- 3 tsp. cinnamon
- Peel from 3 medium to large oranges
- 1.75 oz. Hallertauer hop pellets (4.9% alpha acid) for 1 hour, 45 min.
- 0.5 oz. Saaz hops (3.6% alpha acid) for 15 min.
- 3/4 gal. American ale yeast starter
- 1/2 cup corn sugar for priming

Step by Step:

Mash grains into 3.5 gal. 168° F water and rest at 155° F for 60 to 75 min. Mash out at 168° F. Sparge with 168° F water.

Collect 6 gal. water. Total boil is 1 hour, 45 min. At boil add honey and Hallertauer hops. Continue to boil for 90 min. Add spices and finishing hops and boil 15 min. longer. Chill and pitch yeast. Pitch yeast at 75° F.

Ferment at 70° to 72° F for 14 days. Transfer to secondary fermenter, add fresh yeast, and age for three weeks at 70° F. Bottle with sugar and fresh yeast and age for five to six months.

OG = 1.075

Partial Mash Version:

Substitute 9.5 lbs. dry malt extract or 12 lbs. pale extract syrup for two-row. Place cracked specialty grains in grain bag and steep in 1 gal. of water at 155° F for 30 min. Rinse grain bag with 2 gal. water at 165° F. Top up to 6 gal. and add extract as you bring to a boil. Stir often.

Style Guidelines

Let's face it. We've got experimentation in our blood. It's why we bought that white bucket and can of malt extract in the first place. Homebrewers have been known to put just about anything in their beer — from pumpkin to garlic. That said, be careful about being too "creative" when brewing your Great Beers. Many styles have been developed over generations, to what most professional brewers would agree is perfection. It may be okay to add honey to your Summer Pilsner, but try to stay away from Pumpkin Patch Oktoberfest or Mocha-Spruce Christmas Porter.

If the urge to be unique overwhelms you, do yourself a favor and brew a couple of pilot batches beforehand. Give yourself the opportunity to adjust your recipe into something you can call a masterpiece.

Oktoberfest



Originally celebrated as the wedding of Bavaria's Prince Ludwig and Princess Theresa on October 12, 1810, Oktoberfest has evolved into what people from Munich claim is the largest festival in the world. It may be true that no other beer style could have spawned such a celebration. This reddish-brown, low-bitterness, malty lager is extremely drinkable, especially when the air begins to turn crisp and the cheeks begin to burn red. Oktoberfest lager is brewed with a slightly higher alcohol content than pilsners and a malt character that begs another taste. The beer should be clear and bubbly, reddish brown with a thick, white head. All these characteristics blend together to create the most perfect autumn beverage.

Brew around the middle of June and as early as March to allow the beer to come into full force by the first week of October. Five gallons always disappear too quickly. If you can brew 10-gallon batches, do so. Otherwise, use the yeast slurry from the primary fermenter to brew a second batch two weeks later.



Winter Ales and Lagers

Winter inspires beer that provides warmth and flavor. Dark, spicy, and rich, winter beers are cozy beers. Barleywines, strong ales, and doppelbocks all require extended aging and heavy malt bills.

Every year, near the end of May, I brew a strong-spiced ale for Christmas. The long months in the bottle allow the ginger, orange peel, and cinnamon to blend into a subtle background spiciness to a beer

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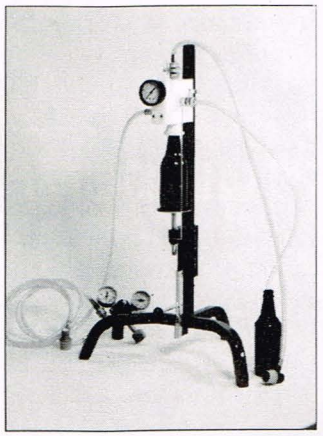
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already full of alcoholic warmth and flavor. A small amount of chocolate malt and a long boil darken this beer and build its complexity and depth. The spices are meant to peek out from the beer subtly, not overwhelmingly. Share the beer with family and friends on Christmas eve or hand out as gifts with the instructions, "Do not open until Christmas."

Doppelbock is another great winter seasonal. Although the style was originally intended to nourish the Bavarian monks as they fasted during Lent, many Americans have found doppelbock goes well with their gluttony during the holidays. It's a great beer for contemplative, snowy evenings by the fireplace. It also inspires raucous voices and blind, broad smiles at Christmas and New Year's parties.

Doppelbock is brewed with plenty of specialty malts and low hop bitterness. The sweet maltiness is showcased with little or no burnt character. Hop aroma should be absent. Toasted malts, along with a small addition of chocolate malt, give this beer its chocolatey flavor. Black malts should be excluded. Dark crystal malts add dextrins and a beautiful complexity to this chewy beer. Brew in early August to give the beer time to mature in the keg.

Originating from the oldest known style of English ale, barleywine combines the most intense flavors possible in a true beer, and then paints them across your perception like a great master creating a work of art. Near the beginning of every year I brew a batch of barleywine with an original gravity of 1.105 to 1.115. Because the beer ages so beautifully, I have a few barleywines in my closet that are more than three years old, my most cherished stock. Proper sanitation and handling will ensure a beer that you will horde like jewels, taking out one or two every so often to enjoy on a silent evening. When you open a three-year-old barleywine, you create an event per se.

Spring Ales and Maibock

Every spring I get a taste for hoppy pale ales and can't seem to brew enough of them. Put away the porters and dunkels and embrace the arrival of longer, warmer days. Quick fermenting, short aging ales are some of my favorites, and the lingering hop aroma and bitterness go great with those warmer, sun-drenched afternoons.

What separates these ales from ordinary ales? Try rare, imported East Kent Goldings hops. These hops aren't easy to find, so look for them early. Possibly they'll have to be mail ordered. Don't settle for regular old hop pellets from the local brew shop. Look around for the freshest whole hops available. Try dry hopping in the keg.

I know pale ales aren't really seasonal beers. But for me they've become a tradition. The fact that they can be ready to drink in as little as three weeks from the keg intrigues me, and it's a great way to replenish your winter stock.



On the other hand, Maibock is a traditional spring seasonal. Brewed in November, this keg is best opened on Easter morning right after church. The beer may be pale-copper to rust colored, deceptively strong, and wonderfully smooth. Small amounts of specialty grains, including Vienna and Munich malts, add complexity to this beverage. Unlike darker bock beers, this beer may vary in bitterness levels and include flowery finishing hops. Use a good Bavarian lager malt and a big slurry of Bavarian or Munich lager yeast.

Maibock
(5 gallons, all-grain)

Ingredients:
- 12 lbs. Belgian pilsner malt
- 1.5 lbs. Vienna malt
- 0.5 oz. cara-pils malt
- 1.5 oz. Hallertauer hop pellets (4.3% alpha acid): 1 oz. for 60 min., 0.5 oz. for 30 min.
- 0.5 oz. Saaz whole hops (3.6% alpha acid) for 10 min.
- 3/4 gal. Bavarian yeast starter

Step by Step:

Mash in to 3.5 to 4 gal. 130° F water. Acid rest at 122° F for 30 min. Raise heat to 152° to 155° F and rest for 60 min. Mash out at 168° F. Sparge with 168° F water. Collect 5.5 gal. water.

Total boil is 60 min. Add 1 oz. Hallertauer hops and boil for 30 min. Add 0.5 oz. Hallertauer hops and boil 20 min. more. Add Saaz hops and boil 10 min. more. Chill and pitch yeast at 75° F.

Ferment at 50° to 53° F for 10 to 14 days. Keg. Slowly drop temperature to as close to freezing as possible (without freezing) and lager for three to five months.

OG = 1.065-1.070

Partial Mash Version:

Substitute 10.5 lbs. light German dry malt extract or 13 lbs. pale extract syrup for the pilsner malt. Place cracked specialty grains in grain bag and steep in 1 gal. of water at 155° F for 30 min. Rinse grain bag with 2 gal. water at 165° F. Top up to 5.5 gal. and add extract as you bring to a boil. Stir often.

Summer Pilsners

In Germany it was tradition to open the paler-colored, lighter-bodied pilsners when the last kegs of bock were depleted. I traditionally open my first batch of summer pilsner on Memorial Day. Two other batches follow, opened subsequently on the Fourth of July and Labor Day. What sets these pilsners apart are some of the rarest hops



Classic Summer Pilsner
(5 gallons, all-grain)

Ingredients:

- 8 lbs. German or Belgian pilsner malt
- 1.5 lbs. Vienna malt
- 0.5 lb. light crystal malt
- 1.25 oz. Hallertauer Mittelfrüh whole hops (4.3% alpha acid): 0.75 oz. for 60 min., 0.25 for 45 min., 0.25 oz. for 30 min.
- 0.75 oz. Czech Saaz whole hops (3.6% alpha acid): 0.25 at 45 min., 0.5 oz. at end of boil
- 3/4 gal. Czech lager yeast starter

Step by Step:

Mash grains into 3.5 gal. water at 166° F and rest at 150° F for 60 to 75 min. Mash out at 168° F. Sparge with 168° F water. Collect 5.5 gal. water.

Total boil is 60 min. Add 0.75 oz. Hallertauer and boil for 15 min. Add 0.25 oz. Hallertauer hops and boil for 15 min. more. Add 0.25 oz. Hallertauer hops and boil for 15 min. more. Add Czech hops and boil for 15 min. more. Add 0.5 oz. Czech hops at end of boil. Chill, remove hops, and pitch yeast at 75° F.

Ferment at 50° F for 10 to 14 days. Keg just as beer begins to darken. Lower temperature to 35° F over one week. Lager at close to freezing for five to eight weeks.

OG =1.045

Partial Mash Version:

Substitute 7 lbs. dry malt extract or 8.5 lbs. pale extract syrup for pilsner malt. Place cracked specialty grains in grain bag and steep in 1 gal. of water at 155° F for 30 min. Rinse grain bag with 2 gal. water at 165° F. Top up to 5.5 gal. and add extract as you bring to a boil. Stir often.

available: imported Hallertauer Mittelfrüh and Czech Saaz. The hops are added precisely throughout the boil to give this beer the character of summer flowers. Czech lager yeast is your best bet at emulating a traditional German pilsner. Ferment the beer at 50° F and keg when fermentation is near completion. Lager at close to freezing temperatures for six weeks.

Summer pilsners go great with outdoor parties and cookouts. I share the beer liberally but try to keep enough in the keg just for myself. On summer weekend afternoons you'll find me on my porch swing drinking a golden, homebrewed pilsner and contemplating the freshly mowed lawn. If that's not something to celebrate, I don't know what is.



CIRCLE 39 ON READER SERVICE CARD

Build Your Own Bottle Storage System

by Ernie Bickerton

If you bottle your homebrew and like to work with wood, you can build a three-part system that drains bottles, stores them upside down, and transports them, filled or empty.

It's simple. Remove your bottles from the sanitizing solution, empty them, and insert them neck down in the draining rack to drain dry. If you place the rack over a sink or drain board, there's no mess to clean up. Once the bottles are dry, attach the removable bottom to protect the necks of the bottles. Sanitized bottles should remain safe to use for several days because the bottles effectively prevent the circulation of germ-laden air through the system. When you're ready to bottle, the separate box (the bottle caddy) can be used to hold freshly filled bottles until they are capped and also to transport the bottles. Used with the draining rack, the caddy is perfect for inverted storage of bottles waiting to be reused or sanitized.

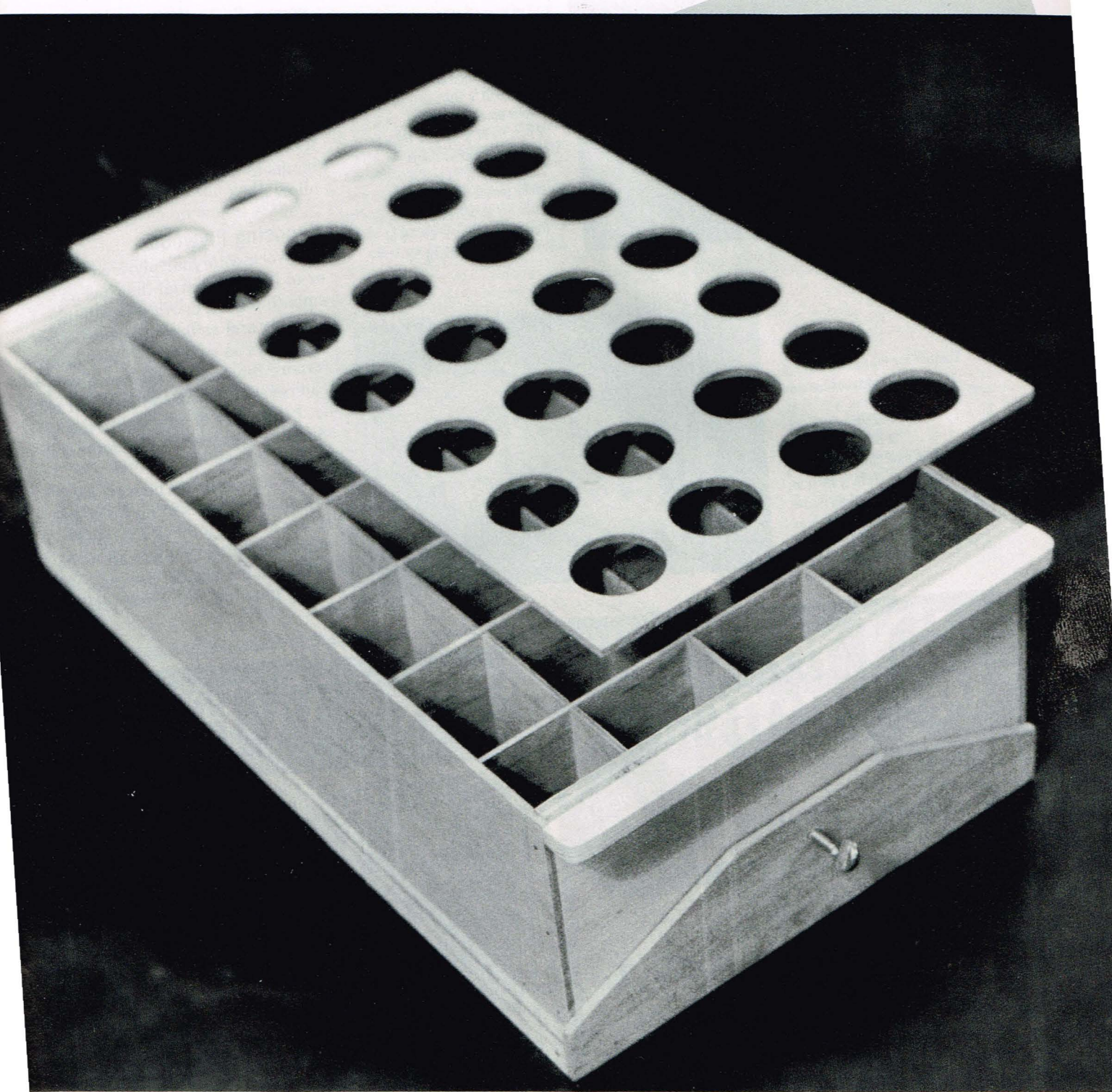
Construction Notes

Construction is straightforward and well within the skills and equipment of the average wood worker. While the measurements for this project are for standard 12-ounce long-neck bottles, adjustments can be made to accommodate other sizes.

All joints are made with regular carpenter's glue and nailed with 7/8-inch and 1 1/4-inch brads. The glue gives the strength to the joint, and the brads merely hold the pieces in place while the glue sets.

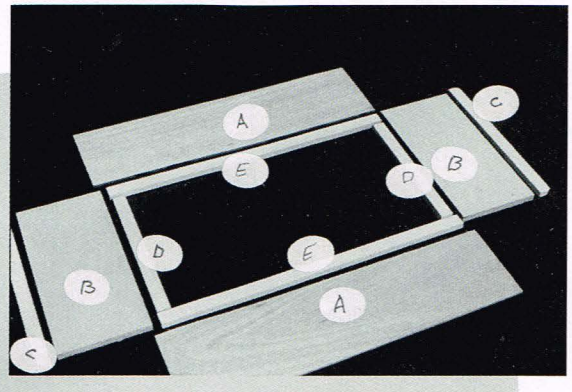
Because standard interior plywood is used, you should apply two coats of water sealer such as Thompsons Water Sealer before you begin construction. This will allow the plywood to shed water in use and will allow the user to spray or wipe the interior of the system with sanitizing solution before inserting the bottles to drain. The system is designed to disassemble into separate sections to aid in this pre-use sanitizing.

Three thicknesses of plywood are used in construction: 1/8 inch, 1/4 inch, and 1/2 inch. While these thicknesses are used in the lumber lists for the project's



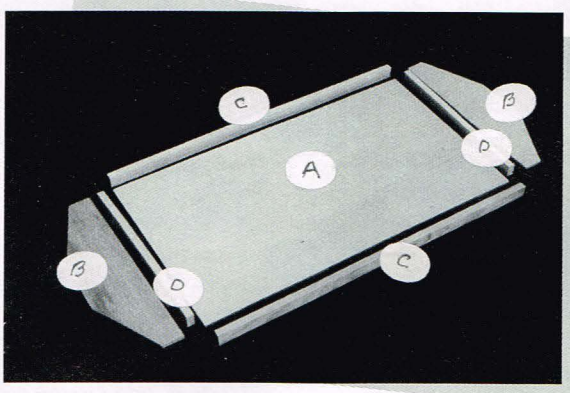
A 28-hole draining rack, the removable box bottom, and a bottle caddy complete an easy-to-build drain dry bottle sanitizing system for homebrewers.

ERNIE BICKERTON PHOTOS



Lumber for the Drain/Dry Box

A- 1/4-in. plywood sides;
2 pcs. 5 in. x 20 1/4 in.
B- 1/2-in. plywood ends;
2 pcs. 5 in. x 10 1/2 in.
C- White pine finger grips;
2 pcs. 1/2 in. x 3/4 in. x 10 7/8 in.
D- White pine ledger frame;
2 pcs. 1/2 in. x 3/4 in. x 9 in.
E- White pine ledger frame;
2 pcs. 1/2 in. x 3/4 in. x 19 3/8 in.
(On pieces D and E, the 1/2 in. measurement is vertical)



Lumber for Protective Bottom

A- 1/4-in. plywood bottom;
1 pc. 11 in. x 19 1/2 in.
B- 1/4-in. plywood ends;
2 pcs. 3 in. x 11 in.
C- White pine stiffening frame;
2 pcs. 1/2 in. x 3/4 in. x 19 1/2 in.
D- White pine stiffening frame;
2 pcs. 1/2 in. x 3/4 in. x 10 1/4 in.
(On pieces C and D, the 3/4 in. measurement is vertical)

components, it should be emphasized that all 1/2-inch thick plywood is not 1/2 inch in thickness. In the case of the boxes illustrated, the *true* thickness was 7/16 inch. While this difference seems insignificant, it can lead to time-wasting adjustments in construction if you don't allow for it.

Choosing Plywood

Work with your plywood supplier to find a material that has as smooth a back or reverse side as possible and as few voids of the inner plys as possible. This caution is more than one of appearance. The reverse side of the material will be the interior of your box. The smoother it is, the better sanitation possible.

Because you will be working with small sections of plywood and relying on glue joints for strength, voids in the interior plys can be devastating to the project because, on a joint or glue line, the outer plys will

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tend to collapse into the void.

After much experimenting, I settled on a mahogany plywood for all thicknesses.

The Components

The project is made in two parts: The first is the draining assembly with removable bottom. There are four components to this part:

1. Bottomless drain/dry box
2. Bottle separator grid
3. 28-hole draining rack
4. Removable bottom

When you complete the draining assembly, the bottle caddy will be relatively simple because many of the pieces and cuts are the same as those in the draining system. There are two components for the bottle caddy:

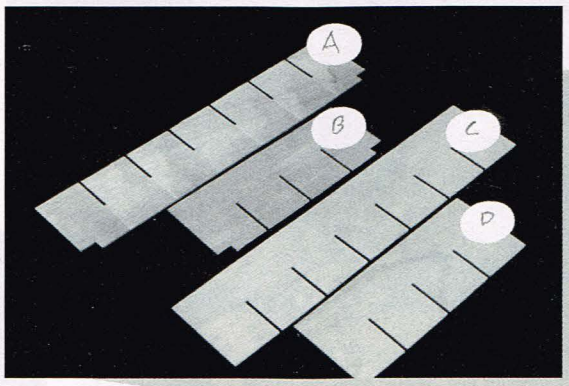
5. Modified draining rack
6. Caddy box

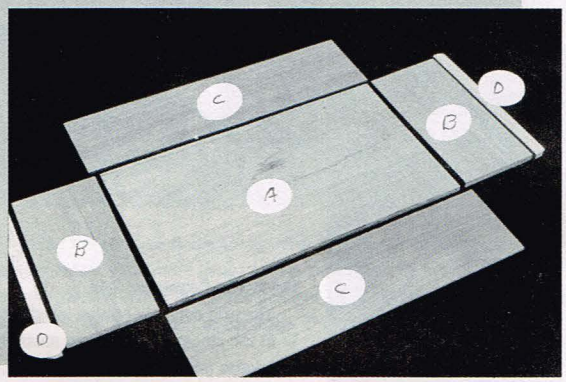
Follow the photos and captions, beginning on page 54, for complete construction details.

Lumber for the Bottle Separator Grid

A (or C) - 3 pcs. 1/8-in. plywood; 4 in. x 18 1/4 in.
B (or D) - 6 pcs. 1/8-in. plywood; 4 in. x 10 3/8 in.

The grid sections for both the bottle caddy and the drain/dry box are the same except the drain/dry sections are notched 1/2 in. x 3/4 in. to allow the grid to fit over the ledge frame and rest on the removable bottom. This prevents the circulation of air among bottles.





Lumber for the 28-Hole Bottle Caddy

A- 1/2-in. plywood bottom; 10 1/2 in. x 18 3/8 in.
B- 1/2-in. plywood ends; 2 pcs. 5 in. x 10 1/2 in.
C- 1/4-in. plywood sides; 2 pcs. 5 in. x 19 3/8 in.
D- White pine finger grips; 2 pcs. 1/2 in. x 3/4 in. x 10 7/8 in.



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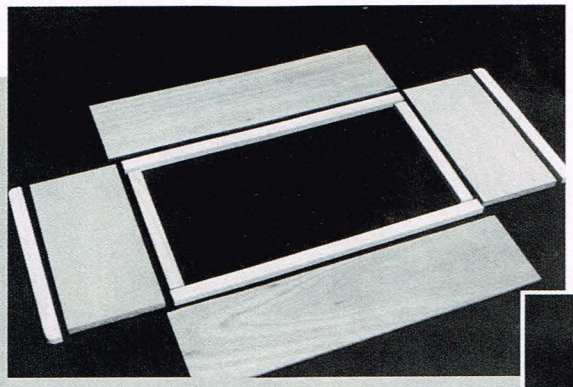
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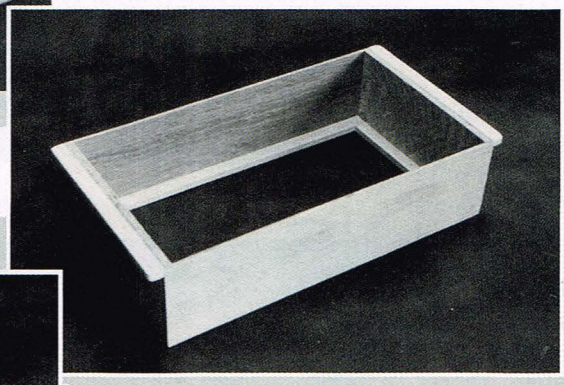
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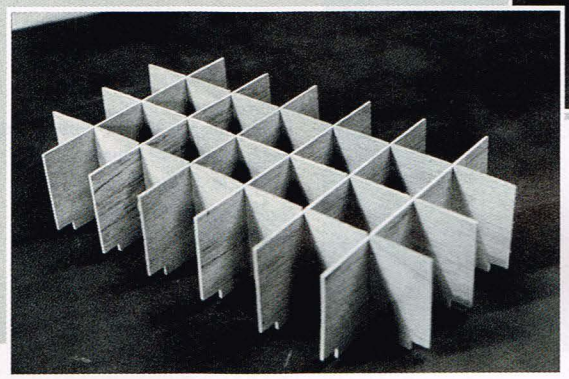
Project Assembly

Follow the illustrated plans for cutting the lumber. Assembly is straightforward. Use wood glue and brads to put together the separate pieces of this project.



Bottomless Drain/Dry Box

The long sides (A) of the drain/dry rack butt up against the outside of the ends (B). The long sides of the ledger frame (E) butt up against the outside of the ends of the ledger frame (E), inside the plywood box. The ledger frame rests even with the bottom of the sides. The finger grips (C) line up with the top edges of the box.



The Bottle Separator Grid

The grid consists of nine interlocking pieces of plywood. To fit the pieces together, you must cut 1/8-in. wide, 2-in. high kerfs (slots) at 2 1/2-in. intervals. The kerfs of the long pieces slip down into the kerfs of the short pieces.

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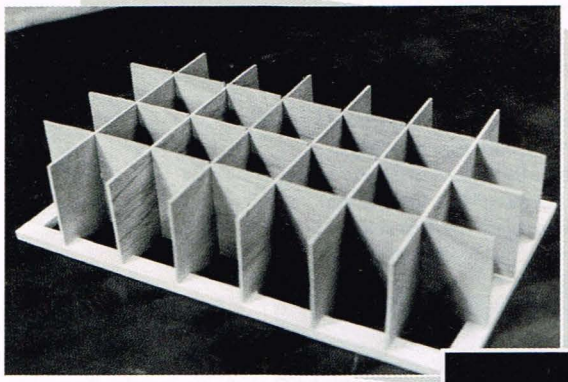
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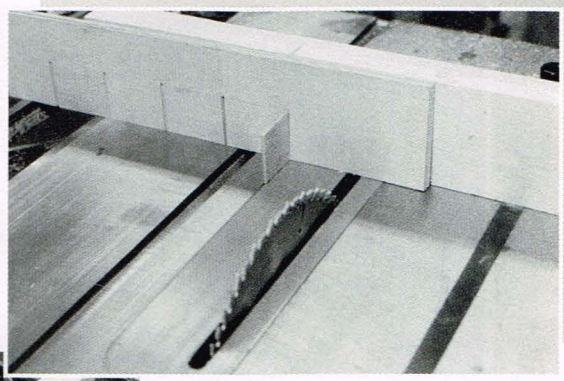
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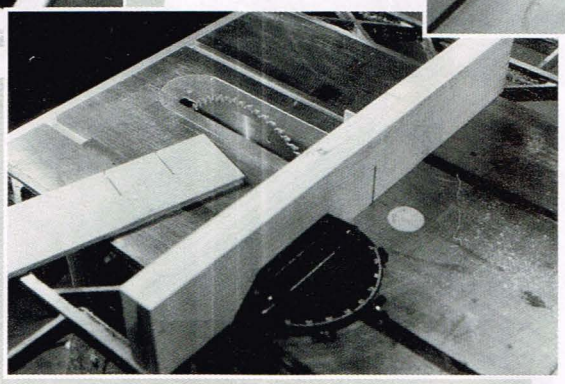
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In the separator grid, the ends of the pieces are notched 1/2 in. x 3/4 in. (horizontal) so the grid rests inside the box, over the ledger frame, touching the bottom and forming separate germ-free compartments (pictured here with the ledger frame, outer box removed). This prevents the circulation of air among the bottle necks.



The first cut of each grid section is made butted against a "finger" and subsequent cuts are made by fitting the previous cut over the "finger." Most carbide-tipped 10-in. blades will give a 1/8-in. kerf (slot).



To cut the kerfs for the separator grid, a simple accessory fence can be added to the mitre gauge on the table saw. The fence (here in the rear view) consists of a scrap piece of lumber (such as a 2 by 4) with a "finger" 2 1/2 in. left of the blade. The blade is set for a 2-in. cut.

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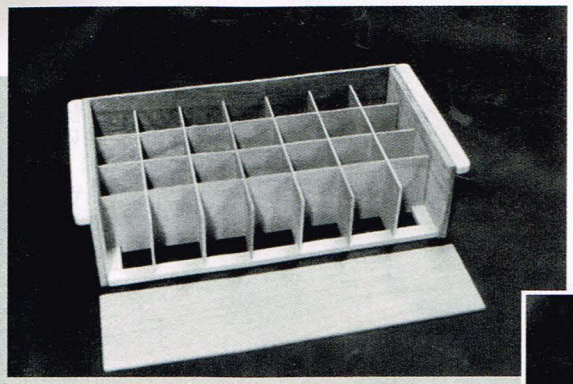
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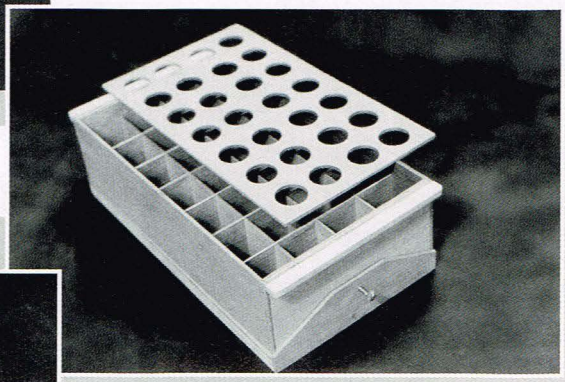
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Techniques used to put together the bottomless box and the grid will be used again to build the bottle caddy. Keep in mind the second project when you are cutting your materials. Many of the pieces, including the pieces for the grid, have the same dimensions.

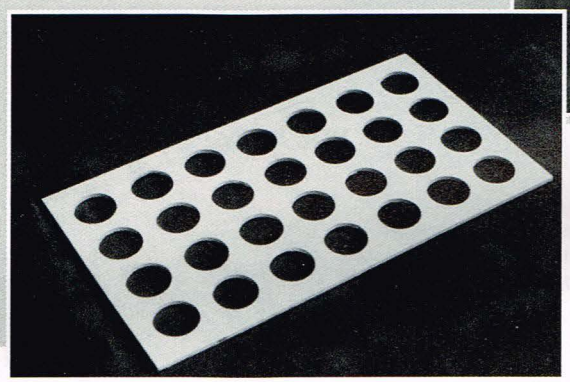
With the bottomless box and grid put together, the bottle drainer is halfway complete. (The side of the box pictured here has been removed for clarity.)



28-Hole Draining Rack

1/4-in. plywood, $10^{3}/4$ in. x $18^{1}/4$ in.

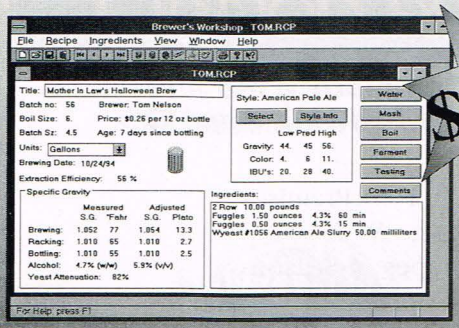
The draining rack rests within the box, on top of the grid. It can also be used with the bottle caddy. If a number of the racks are to be made, put two pieces together with peelable double-sided tape. The drill will cut through the top layer and center mark holes on the bottom layer, saving measuring time.



The holes in the drainer rack are $1^{3}/4$ in. in diameter. Drilling the holes might present the greatest challenge, depending on your wood-working skill and the equipment available. A drill press will simplify the job but is not a necessity. A Forstner bit or an appropriate-sized hole saw does the best and neatest job. Both can be used in a hand-held drill if the work is held in place with clamps.

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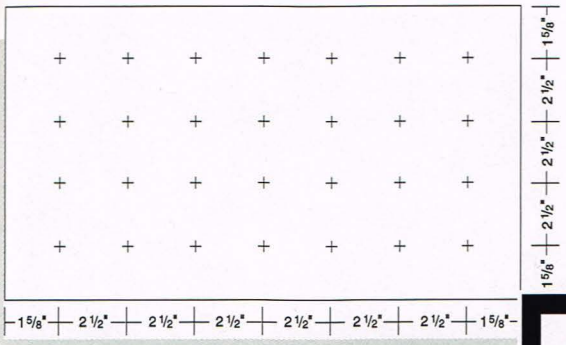
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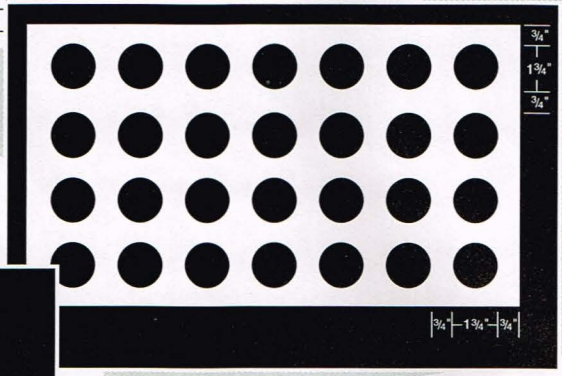
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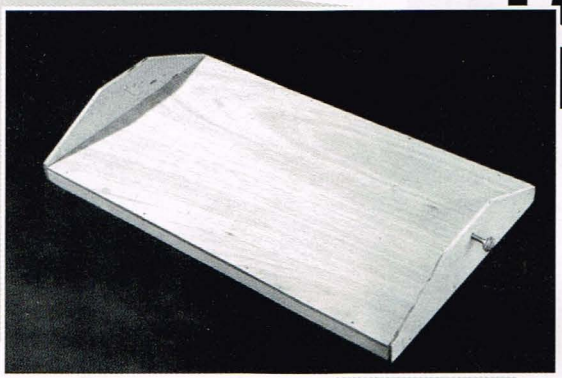
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While the Forstner bit will make a very neat hole for your drain rack, there are some cautions to be observed. Working with thin material, the drill must be sharp. A dull bit will give ragged holes and excessive tear out on the exit side. The glues used on plywood are hard on keen cutting edges. Also, excessive speed in drilling is a danger because the bit will heat up. I take about 20 minutes to drill 28 holes.



The two diagrams show both center measurements and hole lay-out measurements. If drilled with a hand-held drill, the center measurements will prove most useful. If a number of these racks are to be made and you have access to a drill press, it would pay to lay out a drill table using 2½-in. blocks as spacers to center the hole under the drill head.



Removable Bottom

The bottom is assembled with the end pieces (B) sitting outside of the bottom piece (A), not on top. The stiffening frame rests on top of the bottom, inside the ends. The stiffening frame is assembled with the ¾- in. dimension as vertical. This gives a slightly larger area for the glue joint to apply the end pieces.

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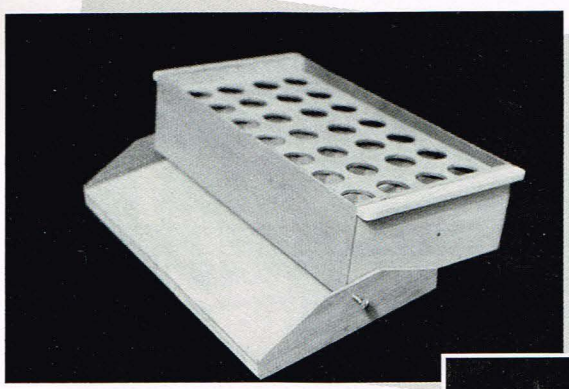
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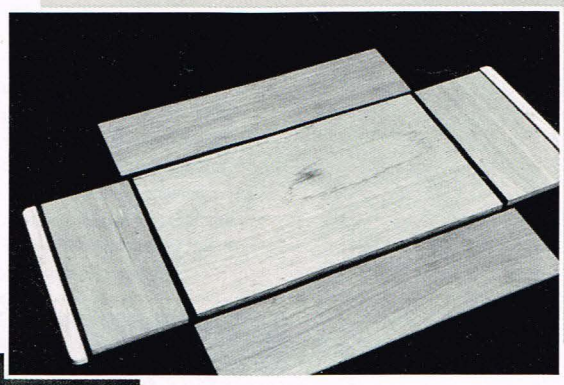
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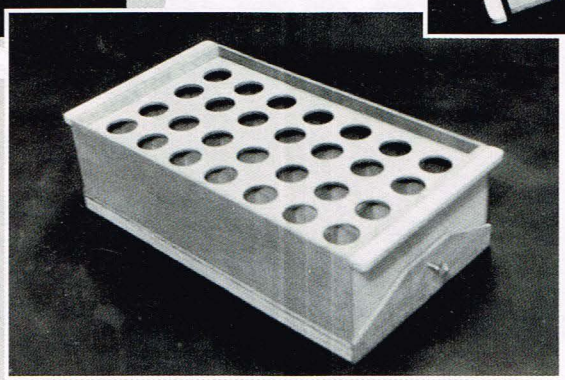
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Bottom and Box Connection

1/4-in. x 1-in. thumb screws; 2 pcs.
1/4-in. tee-nuts; 2 pcs.

The removable bottom can be temporarily attached to the box with thumb screws. The screws are easy to use and will hold the pieces together securely. You will need to drill 1/4-in. holes in the ends of the bottom and the box.

You can set the drain box on the bottom and simply drill 1/4-in. holes through the end piece and the end of the drain box. If you are making more than one bottom, make a separate end piece to use as a pattern to position the holes. That way, if the box components get interchanged, the thumb screw will always go into the tee-nut easily and securely.

Caddy Box

Assembling the caddy box is similar to assembling the bottomless box. The ends (B) sit outside — not on top of — the bottom (A). The long sides (C) sit outside the bottom and outside the ends. The finger grips (D) are flush with the tops of the ends.

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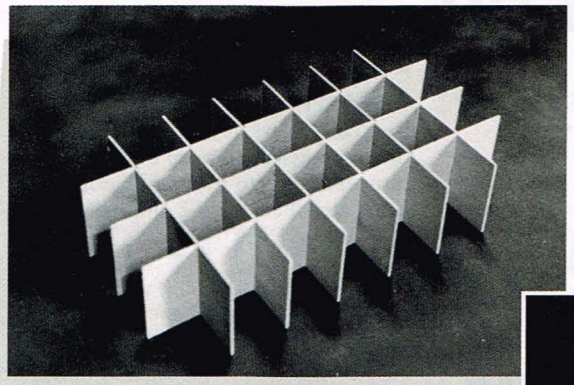
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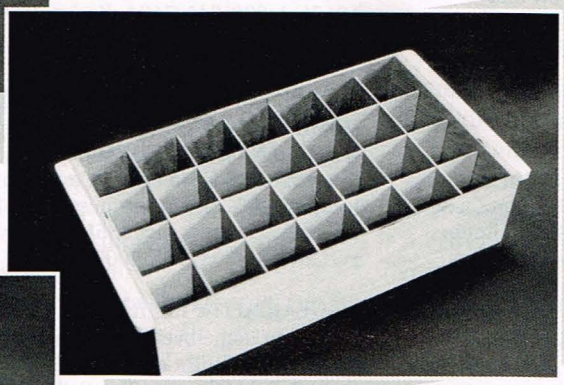
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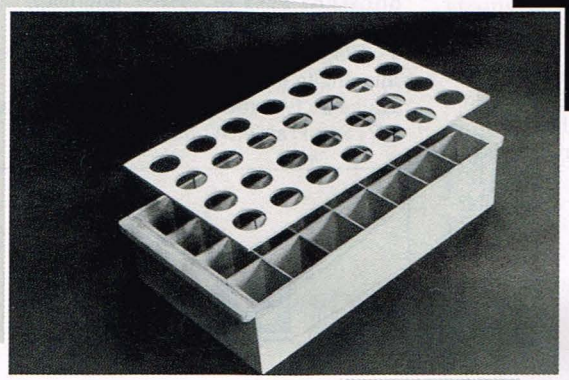


Modified Separator Grid

The modified grid has the same measurements as the original rack, except there are no cutouts for a ledger. The bottom of the rack fits squarely on the bottom of the box.



While the two pieces — the box and the grid — will be used together, it is best to keep them separate. You will want to regularly remove the grid from the box to clean and sanitize both pieces.



Adding the Rack

While the obvious use for the caddy is to hold freshly filled bottles until they are capped, it is sized to accept the draining rack, making it very useful for inverted storage of bottles waiting to be re-used or sanitized.

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Red Wine Maceration

by Alison Crowe

Maceration is an essential step in the process of making red wine. It's to red wine what steeping is to tea or percolating is to coffee; without it, you don't have a colorful, flavorful, strong beverage.

Practically speaking, maceration is really just mixing. Or stirring. Or soaking. You mix up the wine with your hands more often than not if you're a home winemaker, and then let it ferment to dryness before pressing, aging, and finally bottling.

But it's not really as simple as that. Red wine maceration is a hot topic among all winemakers, whether their fermenters hold five gallons or 5,000, and no one is sure whether there is a "best" way to do it to make the "best" red wines. Every wine, just like every winemaker, is different, and all you can do is follow some established guidelines and go on your experience or, failing that, your instincts.

Why Macerate?

If you didn't macerate the red grapes during the winemaking process, you'd end up with a rose wine: pink, fruity, and relatively spineless. White Zinfandels and Blanc de Noirs sparkling wines are made by taking red grapes, Zinfandel and Pinot Noir respectively, and pressing them immediately after crushing and destemming (unless the whole clusters themselves are pressed). Depending on how long the process takes, you end up with a wine tinged with a varying degree of the red grape pigment, spanning the spectrum from barely, blushingly pink to decidedly, vibrantly fuschia.

The color isn't the only thing that's affected by the extent of the maceration. The longer the fermenting wine stays in contact with the aromatic, tannic, and bitter components in the grape skins and seeds (and the more often the must is stirred up to bring them into even more contact with the wine) the more of these compounds, to an extent, will end up in our finished wine.

Stirring up the must while it's fermenting is also absolutely essential to discourage the formation of colonies of various spoilage organisms on top of the "cap," the floating mass of grape skins that inevitably floats to the top of any red wine fermentation.

Anything from fruit flies to *acetobacter* (the type of bacteria that produce vinegar) can land in and flourish on the dry, higher-pH, and nutrient-rich environment that a poorly managed cap can provide. Breaking up the cap and thoroughly wetting all portions of it ensures that most spoilage organisms will be inhibited by the low pH and the high percent ethanol of the fermenting wine.

Further, breaking up the cap releases a lot of carbon dioxide; once trapped beneath the solid mass of densely packed grapes, the escaping carbon dioxide gas creates a cap environment that most spoilage microbes find inhospitable.

The Process

Unlike commercial wineries, you have the luxury of maintaining a hands-on approach to your maceration schemes. If your fermenter has a five-gallon capacity, you can simply use a stainless steel or wooden spoon to stir your must twice a day, much like you would a big pot of stew.

If you ferment in a larger container such as a half-ton

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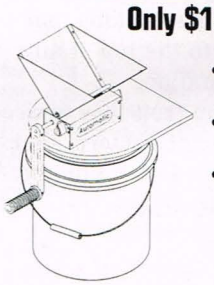
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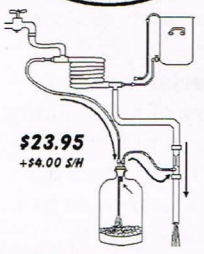
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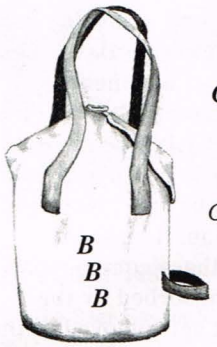
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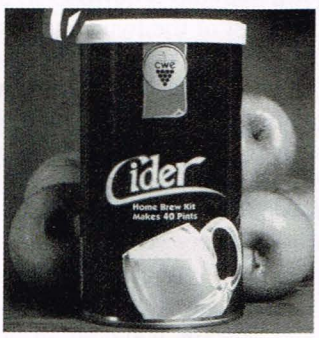
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grape-picking bin, you can improvise a device similar to that of Santa Barbara County winemaker John Kerr for all of his one-ton lots. Start with a thick dowel about 4 feet long. A broom handle will work. Nail a foot-long piece of two by four to the end of it, forming a "T" with the dowel. Use this to literally "punch down" (winespeak for "stirring") the cap and mix it thoroughly into the rest of the must underneath.

Though people who have made red wine probably think that it's a pretty straightforward procedure, they might not realize that there's more to think about than just breaking up the cap and mixing up all the must. But there are a couple of things to keep in mind when working out a maceration strategy.

Sanitation

Even though a well-wetted cap discourages contamination, all of the punching down in the world won't control your fruit-fly problem (and the inevitable vinegar problem) if your fermentation area is a mess. Keep containers covered with either a plastic sheet loosely held with string or with a finely woven piece of cloth like muslin held with bungee cords. The goal is to exclude insects while allowing carbon dioxide gas to escape during the fermentation.

A good practice is to keep the inside lip of your fermenters clean and wiped down as well. Run a clean towel moistened with a strong sulfite solution (60 to 80 ppm) around the inside edge of your plastic buckets before and after you mix your must. This discourages the growth of spoilage bacteria and other contaminants on the dried wine "crust" that can form along the edge of the cap inside the fermenter.

It's also essential to keep the areas around your fermenters washed off and free of the inevitable grape bits that collect anywhere the grand but messy task of red wine making is taking place. You don't have to sanitize your crush pad with industrial chemicals every day; just make sure that you hose the area off and dispose of any solid material

that could provide food and harbor molds, fungus, and fruit flies. The same goes for your punch-down tool, whether it's a wooden spoon or a larger broom handle model. Clean it off before and after use. Even if your punch-down device looks clean, unless it's rinsed and then allowed to thoroughly air-dry, it can provide an excellent home for acetic acid bacteria, wild yeast, and other matter that you might not want in your wine.

Timing and Extraction

Anyone who is interested in making red wine has probably heard of extended maceration, cold soaking, or delayed fermentation. All of these are techniques used to create "extracted," colorful, and tannic wines. They all operate on the concept that the longer the wine is in contact with the skins and seeds of the grapes, the more good stuff will be extracted into the wine. An interesting study done at University of California, Davis, has just revealed what opponents to this have suspected for a long time: that long contact with the skins doesn't necessarily mean a higher proportion of color and tannin in the resultant wine. It appears that over time, these compounds actually get re-absorbed by the grape skins and get removed at the press — and don't end up in the final product at all.

Given this and the high risk of stuck fermentation associated with cold soaking and delayed fermentation, as well as the high possibility of contamination in poorly monitored extended maceration regimens (where the must is fermented to dryness but not pressed until weeks later), it's surprising that anyone would want to use such a technique. It seems that the point of maximum extraction is reached well within the typical fermentation window (around seven to 10 days). If this is the case, who would want to put their wines at risk when adequate extraction will usually have taken place by the time the wine is dry and ready to press anyway?

So it turns out that red wine maceration is a pretty big topic, with a lot of issues to think about. But when it comes down to it, if you ignore most of the hype and just use common sense, it does come down to a pretty simple litany. Do it twice a day. Break up the cap completely. Don't make a mess. Press at dryness. And that's it — until someone else comes up with a "new and improved" maceration scheme, and we all abandon the old tried-and-true methods just to try to see what will happen. Oh, come on, aren't you curious? ■

Alison Crowe is a graduate of the University of California, Davis, winemaking program and works in the university's Department of Viticulture and Enology.

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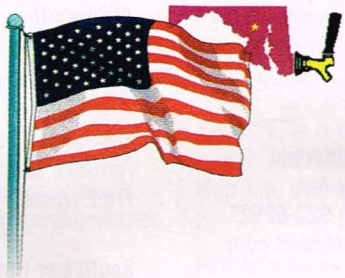
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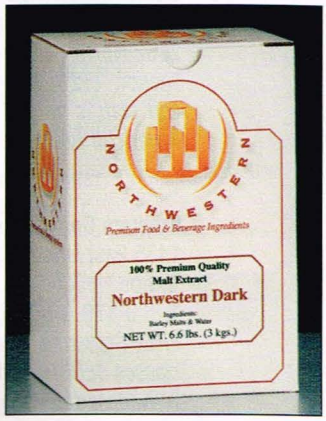
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Hoppy Memories (and Smells)

by Michael Orloski

Each homebrewer has his reasons for homebrewing, but what he might not realize is that his hobby may have something to do with his past. No, I don't mean reincarnation or hypnosis. I'm talking about something in the psyche that can slowly develop or be triggered by an ordinary event.

I grew up in Newark, N.J., in a section known as Ironbound, named after the surrounding railroad tracks. My school, St. Aloysius, was in a former office building of the P. Ballantine & Sons Brewery donated to the church to help give neighborhood kids an education. The brewery was in full production at the time. It is here that I feel my inner self has been guided to the art and science of homebrewing. I was almost like a barley grain getting ready to germinate.

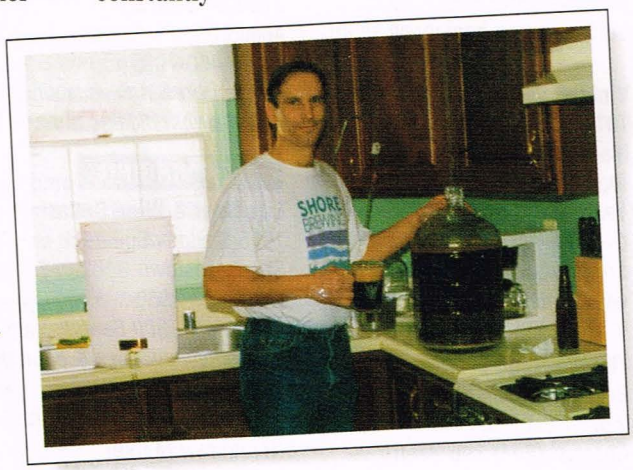
At St. Al's in the fifth grade, I developed a fondness for that pungent aroma wafting in the classroom through open windows on the spring air. I was ever so careful not to get caught watching the busy workers and the noisy cans go by on conveyors.

My daydreaming about all that activity prompted Sister Rita to send a note home to Mom. I also remember being chased by the workers as my friend showed me how to get the overhead doors to move using a crushed ale can and reflecting light on the electric eye sensors. The mystery of what went on there made it all the more interesting.

Well, a year later, in 1964, my family moved to the other end of the city to the area of the kinder and gentler aroma of Pabst Blue Ribbon beer. It wasn't until college, while the regular American pilsners were being consumed, that I got an education in Ballantine India Pale Ale. In comparison to what I was used to, it was absolutely amazing. A fondness was developing. I began wondering about ingredients and their effect on the taste and aroma of different beers.

Years later many hearts were saddened to hear of the closing of Ballantine's plant. Rumor has it that 12 giant wooden tanks of IPA were destroyed as the brew in its prime washed into Newark Bay. Ouch! The new Falstaff product is good but only a faint hint of the original.

All the excitement peaked in 1986 when I brewed my first batch. It tasted great. Things have been constantly progressing as I try new techniques, although I'm still waiting for that noisy clanking sound of cans going by. I haven't quite figured out that process yet. Progressing from extracts to all-grain is rewarding because I can actually tell the difference.



My homebrewing setup. Another batch inspired by fifth-grade memories.

These days the beautiful aromas I create invoke faces on my children only Sister Rita could muster as she passed out our report cards. Because of that, brewing days start with the departure of the school bus. With proper ventilation of the house and kitchen, the air seems clear by the time the bus pulls up again at the end of the day.

"Dad, were you making *beer* again today?" I knew it was coming.

"Oh, why? Can you smell something?" I ask.

"No, there's a thermometer sticking out of your back pocket."

Phew! Lately they admit it doesn't smell "all that bad." Maybe there's a new generation of homebrewers in the making.

Sometimes I get the chance to visit the sites of my childhood memories. The packaging plant, warehouses, towers and brewing buildings are still there, although occupied by other businesses. As a firefighter, there are times I zip past the Anheuser-Busch plant in the summer to get that old scent, albeit ever slight.

Looking ahead, I'm curious to see if history will repeat itself, as my young ones get older.

These days I try to recreate that legendary IPA. I know that being close is good enough.

Some day when I read my hydrometer for the last time and the homebrew tanks run dry, I'll sneak a peek out the window recalling the clanging and remember how the smell of malt and hops can ignite a passion that lasts a lifetime. ■

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