HAWKES BAY AMATEUR WINEMAKERS

AND BREWERS CLUB

April 2023

Hi everyone, and welcome to the end of the Club year.

19th April is our AGM, we meet at the Deaf Clubrooms 22 Lee Road Taradale at 7.30pm. Of course there will be no Speaker or Points cup competition, but we will find out who won all the silverware this year.
Once all the formalities are done with we will have some time to relax with some of your best home brewed refreshments that you will all have brought with you.
Please also bring a plate with some kind of nibbly finger food.

Even though none of your committee members have indicated that they will be stepping down, we would like to see another seat or two filled on the committee, and also someone to act as a backup Steward for when Michael cann't make it or needs a hand.
Have a think about whether you would like to help out, but don't let it put you off coming along to what is usually a very social AGM clubnight.

At last months meeting, we combined the Points cup categories from the previous cyclone scratched meeting, so we managed to get through our annual schedule of judging classes in time for this months prize giving.

Clubnight Raffle;
Still only $2 a raffle or three for $5.
Good prizes donated by recent speakers.
The raffle last month was won by David Grant

Beer Appreciation Day;

Held at Duart House in Havelock North, this was a fantastic day out for many local Beer Appreciators and for those who couldn't make it, watch out for it again next year.

Upcoming events;

- 19th April. Instead of the usual Club Night, we hold the Club AGM. There will be no Points Cup Competition, but please bring a plate and a drink for a social ending to meeting and to the Club Year. We meet at the Deaf Clubrooms 22 Lee Road Taradale at 7.30pm.

- The mini Dusty Gringo challenge between 4 of our All Grain Brewers will be postponed until Nigel can make it. Store your entry in the fridge if you have one running.

- The Club Outing to tour Abbey Winery and Brewery
- postponed as we cann't get a convenient weekend this month

- 6th to 8th October is the date now set aside for the National Competition.

Hopefully we will see **everyone** for this month's AGM, at the Deaf Club Rooms, Lee Street, Taradale, 7.30pm on the 19th April.
Bring some refreshments you would like to share, a plate as well as drinks, and of course a few $$ for the raffle.

CHEERS !
And see you all on Wednesday.
Jim.

"HOP TOPIC"

This Month, we carry on with from Octobers excerpts from Marc Sedams "Guide to Water Treatment".

Mineral Reduction Techniques:

Now that the composition of normal, potable water has been explained, we can attempt to adjust its mineral content to create the right brewing environment. The three most common options available are boiling, filtration (including reverse osmosis and deionization techniques), and dilution. Almost any beer profile can be achieved even from very hard water by choosing a combination of these treatments.

Boiling: I have often described the ease of home brewing to others as follows: “If you can boil water, you can make beer.” Preboiling your brewing water is an easy water treatment step that has many beneficial effects.

Boiling reduces carbonate levels by forcing calcium and magnesium to precipitate out of solution, thereby removing most temporary hardness.* (Any pH or mineral change from a reduction in calcium can be adjusted in later stages.) It removes dissolved oxygen that might otherwise interact with mash chemistry. It also drives off chlorine that water utilities add to your water, thus, reducing the potential to create chlorophenols from reactions in the mash. Boiling also kills microbes (except spores) that might reside in the water, thereby reducing the risk of contamination. Note: If you water is treated with chloramines, most sources suggest that boiling alone will not be sufficient to reduce chlorine content, but research is pending. Carbon filtering should be able to solve this problem, but check with your filter manufacturer to be sure.

On the downside, boiling robs brewing water of valuable calcium (raising the pH and, in my experience, negatively affecting the gelatinization of starch granules) and may impose high energy costs. A brewer’s ability to treat water by preboiling is also limited by time and by the size of the boiling vessel.

*Conventional brewing wisdom suggests that aeration is necessary to provide the means for carbon dioxide to be scrubbed out. Some recent discussions in brewing circles suggests that steam from the boil alone can provide the means for CO2 scrubbing. Thus, heating to just below boiling might provide enough heat for the reaction to occur, but would require aeration.

Table IV: Salt Ion Contribution Scale'

This table lists the individual ions contributed by 1 gram of a particular mineral salt dissolved in 1 gallon of water, measured in parts per million (ppm); ppm = mg/L.

Mineral salt	g-tsp†	Ca^{+2}	Mg^{+2}	Na^{+2}	Cl^{-}	SO_4^{-2}	CO_3^{-2}
Calcium chloride^	3.4	72	—	—	127	—	—
Chalk	1.8	106	—	—	—	—	159
Gypsum	4.0	61.5	—	—	—	147.4	—
Table salt (noniodized)	6.5	—	—	104	160.25	—	—
Epsom salt*	4.5	—	37	—	—	145.3	—
Baking soda	4.4	—	—	75	—	—	95
Hydrated limet	2.1	264.2	—	—	—	—	—

*Data from references 1,6,9.

†Weight given for one teaspoon of loosely packed salt.

‡Water of hydration is calculated into the ppm.

In a home brewing setting, the advantages make a strong case for preboiling all brewing water because the associated energy cost is small and (relatively) infrequent. In fact, boiling is frequently the only treatment necessary for brewing extract-based beers. Once the water cools, it can be decanted off the top of the mineral salt precipitate and is ready for further treatment or brewing. You must make sure not to remove too much calcium carbonate from solution without replacing it in further treatments as calcium chloride (CaCl2) or calcium sulfate (CaSO4).

The disadvantages of preboiling at a commercial scale, however, are significant enough that few, if any, brewpubs or microbreweries use this method. Energy costs alone make this treatment prohibitive.

Filtration: Filtration does not remove minerals and definitely has a higher initial price tag for the hardware, but it does offer valuable benefits and enables you to treat a large volume of water for what turns out over time to be a small cost. Acceptable filtration programs can treat water for about $ 0.02/gal ($ 0.005/L) over the life of the filter!

Carbon filtration. The most common type of filter cartridge contains activated carbon (charcoal) and a tightly-spun lattice of “plastic” with a permeability of <0.5 µm. The design prevents all microbes from passing through, leaving the treated water contaminant-free. Treatment with this type of filter may remove troublesome chloramines, increasingly used to treat city water. The activated carbon absorbs most of the chlorine (which, if left in the water, can lead to the formation of chlorophenols) and organics (nitrates, nitrites) from the water. The two most common filters are made by Brita and Pur and can be found as a water pitcher (about $ 25) or a sink-top attachment ($ 45–60) in almost any home products store. For the purposes of treating large volumes of water, the sink-top filter is more appropriate because it filters the water before it leaves the tap.

Activated carbon/sterile filtration is also appropriate for commercial systems, provided contact time with the filter is long enough. This is done by matching the size of the filtration apparatus with your needed flow rate. A commercial filtration company can size filters based on need.

Reverse osmosis. Reverse osmosis (RO) involves passing water through a series of individual pressurized membrane filters that remove organics, inorganics, microbes, and some minerals. The “bulk water” machines frequently found in grocery stores often use reverse osmosis to treat the local water and usually carbon filter it as well; this water usually sells for $ 0.25–0.35/gallon. It is essentially similar to very soft spring water or distilled water.

Reverse osmosis alone does not affect the chlorine level to an appreciable extent, which means that chlorinated water must also be passed through an activated carbon filter before it will be acceptable for brewing. This method is more expensive on a small-scale setting, but is quite suitable for a large, commercial brewery.

Deionization: This method is also impractical for small-scale brewers but suitable for larger operations. Deionization is a process in which water minerals are removed by ion-exchange resins. The first step of the process removes cations (like calcium, magnesium, sodium, and iron) and exchanges them with hydrogen ions. The second step removes anions by exchanging them with hydroxide ions.

Deionization removes the entire mineral concentration of the water, but does not appreciably reduce the chlorine concentration. Deionized water, like reverse-osmosis water, must be passed through an activated carbon filter to remove chlorine. Of course, a combination of reverse osmosis and deionization techniques, followed by a pass through an activated carbon filter, will yield ultrapure water suitable for any use, especially brewing, and is commonly used in many scientific laboratories.

A word about water “softeners”: Permanently hard water leads to many problems in domestic life, not the least of which is the eventual “caking” of minerals in the water pipes, dishwasher, washing machine, and so forth. To combat these problems, many homes now have water softeners directly attached to the water supply or as part of the filter apparatus that treats the water before it enters the home’s plumbing system. Water softeners come in the form of columns impregnated with cation-exchange resins, or can be added as a handful of minerals and chelating agents (commonly referred to as “water treatment chemicals”) that help remove calcium and magnesium from solution, often replacing these minerals with sodium. The sodium content of water treated with either method is entirely too high for brewing and creates unacceptable brewing water.

Dilution: One of the easiest and most underrated methods of water treatment is a simple dilution with distilled water. The decrease in total minerals is in direct proportion to the amount of distilled water added. For example, to adjust your Dortmund-style tap water to Dublin-style water (see Table V, above), you could dilute the tap water with an equal quantity of distilled water, reducing the overall hardness from 750 ppm to 375 ppm — not a perfect match, but the hardness value will be much closer. Boil the portion of your water to be diluted and add it to the appropriate amount of distilled water. Of course, a Dortmund-to-Plzen dilution might not be worth the cost of the distilled water: It would require a 1:10 dilution, but the mineral profile comes remarkably close.

More next time if there is nothing more exciting to share …..
Jim.