

MALTING with Brendan O'Sullivan at Grain & Grape 12/8/17

Malting: the process of germinating a grain to make it suitable for brewing. This reduces undesirable protein and glucan, and produces the enzymes that we require for mashing. The final stages of malting dictate the type of malt produced (base malts through various “specialty malts”) If you're familiar with sprouting beans, or activating almonds – you're all over it.

Step 1: Hydration – 1 – 2 days

Purpose: Increase moisture (10-12% up to 42-48%)

How: Soak, wait, drain, wait. Repeat as/if necessary til uniform “chitting”

Geeky: Activate “Gibberelins” aka hormones in embryo

Note: Grain must have passed “dormancy” (2-3+ months rest period after harvesting)

Ideal temp: 16C (12 – 20C) Warmer = faster but uneven, off flavours, less extract.

Soak times: 12-24 hours initial, 6-12 hours subsequent (too long and grain will drown)

Aeration times: 6 – 12 hours (oxygen is important)

End goal: uniform chitting

Step 2: Germination – 4 – 6 days

Purpose: Turn a seed into something we can brew with.

How: Keep warm, turn (with a rake or by hand) daily (ideally twice a day) to prevent matting of roots and overheating and to ensure uniform germination. You can literally do this on the floor (so long as it is clean!)

Geeky: Degrade the “endosperm” to prepare it for mashing. “Modification” refers to the breakdown of protein and glucan, and “diastatic potential” refers to the amount of amylitic enzymes produced.

Ideal temp: 16C (15 - 25C) warmer = faster, off flavours, less extract

Increase air flow to encourage faster germination (oxygen is good)

End goal: shoot (acrosphyre) is 1 – 1-5x length of grain

Step 3: kilning

Purpose: to halt conversion and reduce moisture to produce a stable product.

Key is good air flow, less than 30C til moisture is around 10 -15% (by weight, volume or “feel”)

Once moisture reduced, higher temps can be employed

How: Simple kilning at low temperatures will result in pilsner-like malts, at higher temperatures (and for longer) will produce ale, vienna or munich malts, even longer and higher temperatures will produce amber, brown or melanoidin malts. This can be taken even further to roast malts to a significant degree, but should be done with care! Raw grain can also be toasted/roasted (ala Guinness' roasted barley) for different colour and flavour.

Base malts:

pilsner – 12 hours at 60C

ale – 12 hours at 65C

dark ale – 12 hours at 80 - 85C

vienna – 12 hours at 95C

Munich 24 hours rest at 52C then 12 hours at 110C

Toasted malts: (keep layers to ~**1cm** to ensure even heating and flavour/colour development)

light amber (biscuit/melanoidin) - 15 mins at 180C

amber (toasty) - 30 mins at 180C

brown – 60 mins at 180C

dark roast – 60 mins at 220C

Rather than drying, the green malt can be “mashed” to encourage conversion of starch, then roasted at high temperatures to create crystal malt. This can also be done by rehydrating dried malt. An alternative is to roast the green malt without the mashing step, which will mechanically crystallise the starch (rather than enzymatically)

Combinations of different times, temperatures and moisture levels will create different products.

EQUIPMENT

Steeping vessel options

- buckets
- plastic trays (preferable, can be used for germination too)
- mash tun

Germination vessel options

- plastic tubs/trays
- the floor
- hot box or fridge heating thermostat (and a lamp/heat belt/heat pad) – overkill?

Drying options

- the floor with a fan
- dehydrator (must have low temp setting – max 30C)
- a blow box with extractor fan (any chamber with mesh/screen bottom and extraction)

Toasting/roasting options

- oven (easiest)
- toaster oven
- coffee/nut roaster
- skillet/pan

Take care if malting rye – not common in Australia, but ergot of rye (mould) can produce lysergic acid (unless you're into that kind of thing)

Wheat is quicker, but can be more challenging (damages easily)