

MALTING PROCESS IN A NUTSHELL

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First, you need to select raw barley that is suitable for brewing. A professional maltster measures the amount of protein in the grain, looks for suitable moisture content, etc. You, on the other hand, can only gauge the quality of the grain by look and feel. Look for large plump kernels of 2-row barley. You also want the kernels to be of fairly consistent size to encourage a consistent germination rate later.

Okay. You've got your barley, what next?

Well, you need to soak it in water. You want the water content of the barley to get up to about 45%. This means that if you're malting 10 pounds of barley, you want it to weigh just over 14 pounds when you're done. The soaking process will take you a minimum of 40 hours, or at least two days. Historically, quality malts were soaked 65-72 hours [1]. During this time you need to change the water at least daily, and preferably every 8 to 12 hours. You could also devise system whereby the water is constantly but slowly drained while being replenished by some type of slow sprayer. Nineteenth century maltsters changed the water every 24 hours, but current practice is to sprinkle fresh water over the grain constantly---which also allows the soaking time to be reduced to the 40-45 hour range.

After your barley is soaked, you need to germinate it. The traditional floor malting method should work fairly well for you. To do this, spread your soaked barley on a clean floor to a depth of about 8 inches. The temperature in your germinating room should remain consistent at about 60 degrees F. It will take about 8 to 15 days for the barley to germinate. During this time, you will need to turn and move the barley about every 12 to 24 hours. You should also spray a light mist over it to keep it moist, though not wet. Note that the time the barley takes to germinate properly can vary widely. Less than 8 days is possible, though sometimes as much as 24 days may be required.[1]

Examine the barley to see when germination is complete. You want to look for the new growth stemming out from the end of the kernels and up the back of the grain. This growth is called the "acrosipire". When the acrosipire is roughly the same length as the kernel, the malt is fully modified. If you let it grow longer than the kernel size, the malt is said to be "over modified". If it is shorter than the kernel size, the malt is "under modified".

Neither under nor over modified malt is desired. Undermodified malt still has starch in the grain that could be converted to sugar. Overmodified malt has already started consuming the sugars during the normal plant growth cycle.

When the malt is fully modified, you need to "kiln" it. This is a 2-step process: drying and curing. In the first step, you are drying the malt at a low heat over a long period of time to drive off the moisture. This is typically done at 90 to 100 degrees F with constant

air movement, and takes about 2 days. The grain is done drying when the moisture content drops into the 4 to 5% range.

In the curing stage of kilning, the temperature is raised to 172 to 220 degrees F for another day and half to 2 days (in the 1880s, the preferred temperature was 172, in the 20th century, the practice changed to use 180-220 F).

If you are producing lighter colored pale ale malts, your malt is now ready. However, if you want darker colored malts, you would increase the temperature during the curing stage to produce what are called "high kilned malts".

Some malt varieties would require some changes in the schedule. For a black patent malt, you would roast the malt in a revolving drum at over 400 degrees for one to two hours. For an amber malt, you would increase the temperature during the last 14 hours of drying time to about 140-150 degrees. To make a crystal malt, you would take the germinated barley and heat it to 150-170 degrees for 2 hours with no ventilation, and then increase the temperature to about 250 degrees F. [1,2]

REFERENCES:

1. "Steeped in Tradition: The Malting Industry in England", by Jonathan Brown, 1983, University of Reading Institute of Agricultural History, Whiteknights.
2. "Malting and Brewing Science, Volume I", by J.S. Hough et al., 1982, Chapman and Hall, London and New York.