2019 NEW SEASON MALT GUIDE

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As the freshly harvested barley makes its way through the Malthouse, we want to make sure that you're prepared for any changes that might be thrown up as you transition from crop 2017 to crop 2018. That's why we've worked with our master maltsters and brewers to prepare this handy guide to the season changeover. This guide is also particularly useful when you change over base malt generally.

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HARVEST 2018

As you may well have noticed, this year has been an unusual one in terms of weather. While we all basked in the sunshine, the extended period of drought and heat produced an unusual and extreme growing season for our precious barley.

Barley gets planted at two times in the UK; one crop in October/November of the preceding year (referred to as winter barley) and one in the March/April of the crop year (known as spring barley). This year, the winter barley got a good soak in the wet winter and spring and so got an excellent start to growing in the new year. This also meant that when the warm weather did start, the plants had a good water base to survive through the drought.

The spring barley didn't have as much of a fighting chance. Because the rain was prolonged throughout Jan-March, the grounds were saturated and farmers struggled to get the spring barley planted due to poor ploughing conditions and flooded fields. The warm weather started soon after this and so the spring barley plants didn't get a great start and struggled through the drought.

Fortunately for Crisp, the North Norfolk area around our Great Ryburgh Maltings is well suited to winter barley. Indeed, we've been working with local farmers to grow barley locally for almost 150 years. While this is a relatively small crop in the wider UK market, we've found it consistently performs well in our malts and once again it has returned a good crop with all the key characteristics for producing excellent beer; namely low nitrogen/protein and good starch levels for extract.

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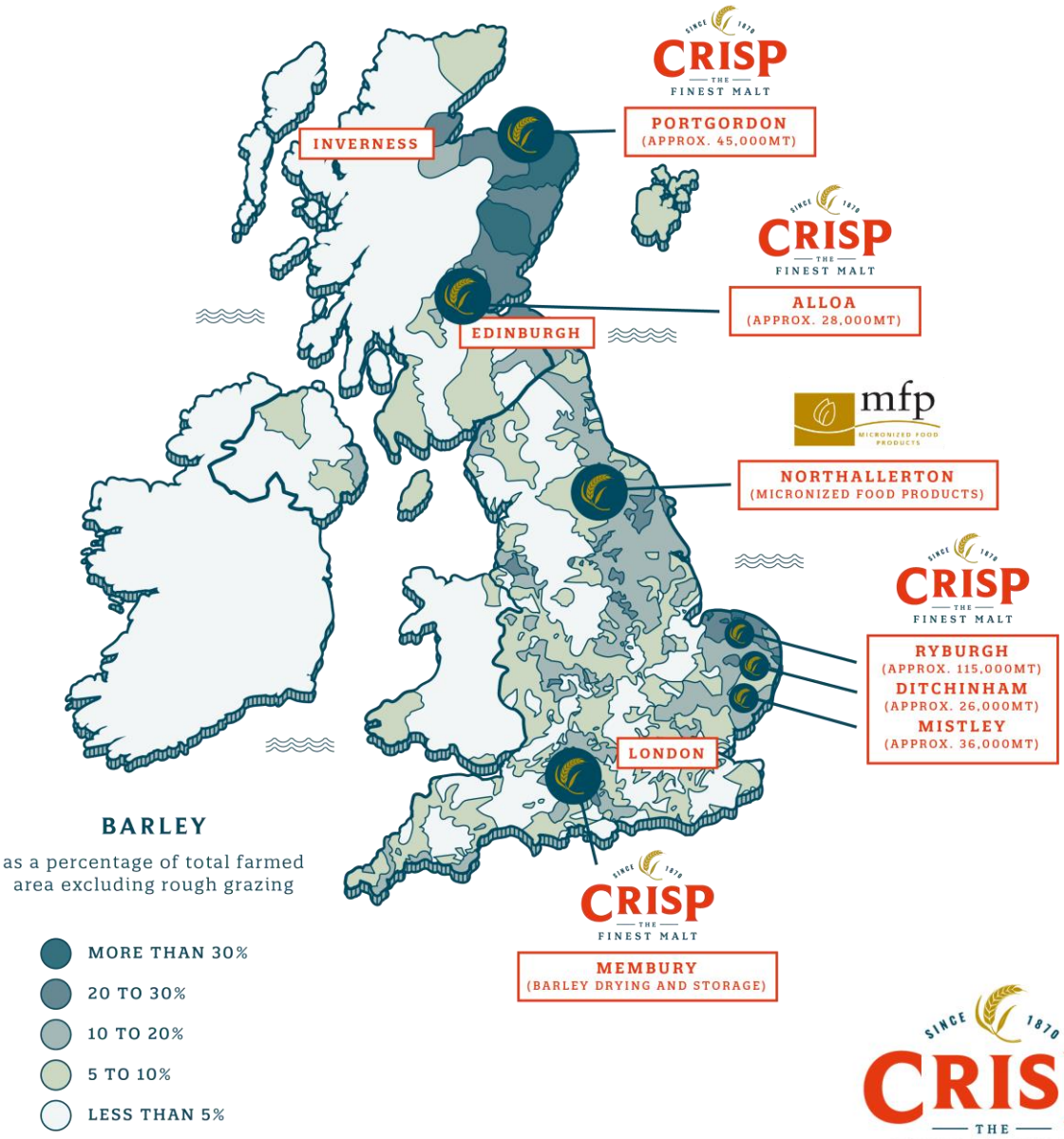
HARVEST 2018 (CONT.)

This all being said, the hot weather has meant that there were simply less barley plants that came to maturity and the result is a drop in yield for both winter and spring crops. This has been mirrored in crops across Northern Europe, coupled with additional demand for feed leading to significant increases in the European grain markets. We have minimised these increases as much as possible through having strong relationships with our all-important British farmers up and down the UK.



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WHAT'S CHANGED?

Our lives as maltsters, brewers and distillers would be much simpler if the barley didn't change from year to year. While we do our utmost to iron out quality variations from crop to crop, there are always going to be subtle changes in the biology of the plant which can affect the way the malt behaves in the mashtun. We've written up some of the changes that we see in the barley and how they might affect your brewhouse practices.

CORN SIZE

The corn size can vary depending on the variety and weather. We are looking for plump grains that will take up water well in malting. At Crisp we remove the small corns (any corns that passes through a 2.25mm screen) and this ensures we get an even malting of the batch. If the corn size distribution has changed it means the milling might also change. On the bagging line we are constantly checking the grist fractions by performing a sieve analysis. If you mill your own malt then this is a simple test that you can also perform. Milling too finely and you could end up with higher extract, over attenuated beers and a stuck mash. Milling too coarsely can lead to lower extracts by leaving sugars behind in the grain bed. Take a look at our quick guide on how to optimise your grist.

	MARIS OTTER		WINTER BARLEY	
YEAR	2017	2018	2017	2018
CORNS <2.25MM	4.4	6.0	3.0	4.0
CORNS >2.5MM	84.4	79.8	90.1	88.4

FRIABILITY

Friability is a measure of how easily the malt will mill. The more friable the malt the less energy required to break it apart. We often see malts from the continent and some part of the UK with poor friability (in the 80s). We would ideally want friability to be in the 90s. This is an indication of good malting practice. A change in friability means your mill setting may need to be adjusted. As mentioned above, we recommend a simple grist analysis to check your milling is optimised.

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NITROGEN/PROTEIN LEVEL

The barley plant can put its energy into making starch or protein, more commonly referred to in the UK by its base element; nitrogen. Generally, when the nitrogen goes up, the starch goes down and we lose extract. There is a very specific sweet spot for ale and lager malts for nitrogen content, namely 1.35-1.55% N2 for ale malt and up to 1.75% for lager malt. (8.44-9.68% protein for ale and 10.94% for lager).

A good practice at the changeover in season is to optimise your kettle finings. This will ensure you're taking enough protein out of the boil which will help with yeast health and also ensure bright, shelf-stable beers. Contact your finings supplier for advice on performing the simple finings optimisation tests.

Yeast growth and viability can vary depending on the total nitrogen of the crop affecting the Free Amino Nitrogen (FAN) content and make-up. If yeast growth and viability are adversely affected, indicated by sluggish fermentations, the only solution is to add yeast nutrients and increase pitching rates. Some yeast strains are more sensitive to FAN than others.

	MARIS OTTER		WINTER BARLEY	
YEAR	2017	2018	2017	2018
TOTAL NITROGEN	1.50	1.39	1.55	1.48
PROTEIN	9.38	8.69	9.69	9.25

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EXTRACT

As mentioned above, the extract may vary due to the protein content of the malt. We work very hard to ensure a consistent extract from season to season and throughout the year. It's always good to periodically read your certificate of analysis to check if the extract has changed. You should always work with the "AS IS" extract not the "DRY" extract for making gravity calculations. If you're unsure of working out target gravity we can provide a handy calculator spreadsheet.

DIASTATIC POWER (DP)/ ENZYME POTENTIAL

The diastatic power is a measure of the enzyme activity in the grain; the higher the DP the quicker the conversion rate from starch to sugar. The determination of gravities (thus ABV) is an enzyme driven process and is affected by enzyme potential, mash time, temperature and thickness. The enzymic potential can be seasonal and will affect the formation of different sugars, the higher the number of complex sugars the slower the beer will ferment towards the final gravity. On the other hand, too many simple sugars will cause over-attenuation and higher than expected alcohol content. The way to solve these issues is to use the mash temperature and thickness to control fermentable sugars;

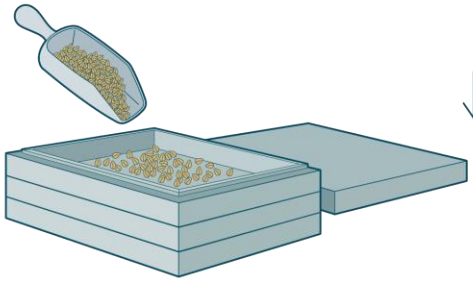
- Thin mash/low temperature (63'C/145'F) will encourage simple sugars to be formed
- Thick/high temperature (68'C/154.5'F) will encourage more complex sugars to be formed

We would always recommend carrying out a simple starch test using iodine to check that you have full conversion of starch into sugar. As soon as this conversion is complete you can start to run off.

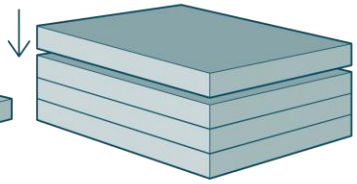
GRIST SHAKE TEST GUIDE

At Crisp we monitor the grist fractions on every single batch of crushed malt that passes through our mill. It is only by doing this, that we can optimise the balance between run-off and extract for our brewers and distillers. We do this by using a simple grist box as shown. If you mill your own malt then this is an essential test to perform every few weeks and especially when moving from one crop season to another, or from one base malt to another.

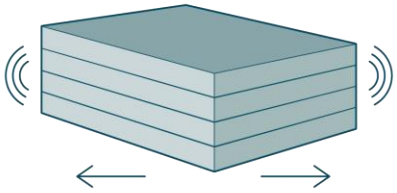
1. Take a representative sample of grist from your mill



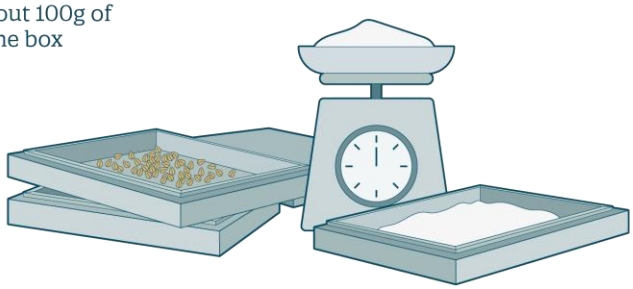
2. Place about 100g of grist in the box



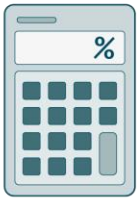
3. Replace the lid



4. Shake for 2 minutes from side to side



5. Weigh out the fractions in each layer of the box (we find a soft bristled paint brush helps get all the malt out the box)



6. Sum the weights to arrive at a total and calculate the % fractions in each layer of the box

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MILLING OPTIMISATION

(CONT.)

These are the fractions we work to at Crisp for crushed malt but if you operate a lauter tun then you may wish to mill a touch finer.

SIEVE	CRISP BASE CRUSHED MALT SPEC
COARSE (ABOVE 1.98MM SCREEN)	40% - 50%
FINE (BELOW THE 1.98MM SCREEN)	35% - 45%
FLOUR (BELOW THE 0.212MM SCREEN)	MAX 12%

Regular maintenance of your mill, including monitoring of the wear on the roll pack will ensure consistent mill performance.

If you're in any doubt about your milling performance, then please speak to our technical team who will be happy to assist.

TYPICAL IOB ANALYSIS 2019

	MOISTURE	TYPICAL EXTRACT	COLOUR RANGE (EBC)		N2 (%) RANGE		SNR RANGE	
FINEST MARIS OTTER® ALE MALT	3.5	308	5	7	1.35	1.55	38	43
EXTRA PALE MARIS OTTER® ALE MALT	4.5	308	2.5	3.5	1.35	1.55	38	43
BEST ALE MALT	3.5	310	5	7	1.4	1.55	38	43
EXTRA PALE BEST ALE MALT	4.5	310	2.5	3.5	1.4	1.55	38	43
EUROPILS MALT	4.5	308	2.5	3.5	1.5	1.75	36	40
GERMAN PILS MALT	4.5	307	3.1	4.0	1.5	1.75	33	38

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GET IN TOUCH WITH OUR TEAM OF MALTSTERS

If you have a desire to dig more deeply into any of the technical aspects of this guide then please get in touch.

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