



## Harvest and Storage of Malting Barley

### Malting Barley in New York

There is a growing interest in malting barley in New York due to the premium prices that can be received for high quality grain. To receive premium prices from malt houses, specific standards are required. In order to grow grain that meets such high quality standards, precautions must be taken during the growing season at different crop growth stages, but quality must also be protected after the grain leaves the field. In this fact sheet, harvest, storage and other handling techniques for malting barley will be discussed.

### Quality Factors

The integrity of the grain will impact its value. Malt houses are looking for grain that is bright gold in color, along with kernels and husks that are both intact. Other important quality parameters include the germination rate, protein level, plumpness and uniformity of the kernels. Typically, high quality barley has less than 5% broken kernels, a protein content of 9-12%, and a germination rate of 95% or higher. Finally, grain should be free from blight and other diseases. The harvest process itself and storage of the grain can greatly impact these quality factors.



Figure 1: Spring malting barley variety test plots in Orleans County, NY

### Combining

The timing of harvest of a malting barley crop is determined by a combination of factors including weather, barley variety, and maturity. Although there are several methods for harvesting barley, for malting barley straight (direct) combining is most widely used in New York. Straight combining harvests the grain directly from the standing crop rather than cutting the barley down into swaths first and harvesting it later. Because straight combining harvests the barley in one single operation, it is less time-consuming than other combining processes. Furthermore, this method reduces risk of harvest losses.

For optimum grain yield and quality, barley should be cut as soon as it can pass through the combine. At this time the moisture level of the grain is 16-18%. For some varieties, the straw may still be a little green. In the Northeast, the general goal is to harvest before rain causes pre-harvest sprouting. A hand-held grain moisture tester can be used to determine moisture content and set the timing of harvest. If barley moisture levels are too low during the day, combining can be done in the early morning or in the evening when the grain has a slightly higher moisture content and therefore is less susceptible to breakage.

Weeds, other grains in the crop, kernel damage, and straw quality, will all be factors in determining combine settings. Typically, for barley, rotor-type combines should be set between 600 and 900 rpm. Both walker type combines and rotor type combines should have cylinder and concave clearance between 3/8<sup>th</sup> and 1 inch. Cleaning off awns while combining can be aided by attaching concave cover plates on the back of the combine and using a de-bearding bar in the front of the concave. Check the operating manual when making all combine adjustments.

### Cleaning and Drying the Grain

Cleaning the grain before it enters storage helps to rid the grain of diseased kernels and any foreign material, such as parts of stalks, leaves, or weed seeds. Cleaning the grain may

increase the overall test weight. Many farmers are using an on-farm grain cleaning system.

Grain drying is necessary because grain moisture at harvest will be above 12%, the ideal moisture content for storage. When drying, the grain temperature should not exceed 100-110°F. Higher temperatures are undesirable because they can reduce seed germination (germination of seed is needed for the malting process), and cause cracks in kernels and other breakage. Natural aeration is safer. With natural aeration, grain with up to 17% moisture can be dried using an air flow rate of 0.75 to 1.0 cubic foot per minute per bushel and an average temperature of 70°F. This process can reduce moisture in the grain and can help get the moisture content to the ideal level for storage of 12%.



Figure 2: Alba variety 6-row winter malting barley a few days before harvest.

### Storage Conditions

Grain will store best when it is cool, dry and clean. Un-dried grain with a moisture content of more than 15% should not be stored for more than a week. Grain that is stored with high moisture can become contaminated with toxins and mold, which will make it unfit to sell. Before storage, grain bins should be dry and clean. In addition to sweeping and vacuuming the bins, an insecticide can be applied prior to storage of conventionally

grown malting barley. Adding screening of vents to the storage bins can also be useful in reducing insect infestations. Furthermore, keeping the grain aerated will help keep insect pressure suppressed, as reproduction rates are lowest below 70°F. Pre-treating the grain with an insecticide before going into storage will further protect it from insect damage. For organic malting barley consider applying diatomaceous earth to the grain as it goes into storage to reduce insect damage. Regardless of the material one decides to use, always follow label instructions for application rates of all materials.

### Summary

Harvest and storage conditions can greatly affect the quality of malting barley. During growth, harvest, and storage, it is crucial to understand the quality standards set by local malt houses. Barley should be harvested when grain is 16-18% moisture using straight combining. Grain should be cleaned to remove any foreign materials prior to storage and dried to a target moisture content of 12%. During storage, keep the temperature between 20°F and 70°F. Following these practices can result in a consistently high quality product for the malting industry.

### Additional Resources

- Harvesting, drying and storing malting barley. American Malting Barley Association. [http://ambainc.org/media/AMBA\\_PDFs/Pubs/Production/Harvesting.pdf](http://ambainc.org/media/AMBA_PDFs/Pubs/Production/Harvesting.pdf).

### Disclaimer

This fact sheet reflects the current (and past) authors' best effort to interpret a complex body of scientific research, and to translate this into practical management options. Following the guidance provided in this fact sheet does not assure compliance with any applicable law, rule, regulation or standard, or the achievement of particular discharge levels from agricultural land.

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