Cornell Cooperative Extension

Malting Barley

KEYS TO SUCCESSFUL PRODUCTION
IN NEW YORK STATE

Have a marketing plan before you plant

Contact a malthouse before planting to determine their need for the crop and preferred varieties. A contract with a malthouse is recommended. The contract should be specific to the variety(s), acres contracted, price/bu, and the grain quality parameters required to fulfill the contract. Contracts allow:

1. malthouses to secure the quality and quantity of barley they need, and
2. growers' security to have a home for the malting barley they grow, provided it meets quality standards.

Choose variety based on market demand and regional performance data

Choose varieties based on Cornell University's variety-screening program to select modern varieties that have the potential to perform well in NY. Cornell evaluates malting barley varieties for yield, grain quality, lodging, and disease resistance potential.

Use certified seed to insure variety purity so that you deliver to the malthouse the variety for which you contracted. Using certified seed reduces the risk of introducing weeds, and also reduces the risk of seed borne diseases that can affect yield and quality.

Do not mix varieties within a field or in the bin. Malthouses are looking for lots of malting barley of the same variety so they can malt uniformly and sell a consistent product.

Grow winter barley vs. spring barley based on risk/benefit for your farm

Choices between winter and spring malting barley should be based on understanding the risk, yield, grain quality, and recommendations of the malthouse to which you are selling.

Winter barley

Average winter barley yields are typically 60-80 bushels per acre– but they are also the least winter-hardy small grain that can be grown in New York so management guidelines for planting date and depth and soil drainage must be followed or frost heaving and plant death will occur. Since snow cover is key to protecting winter barley from extreme temperatures and drying winds, some degree of winter damage may occur in fields lacking snow cover, even if best practices were followed. Avoid varieties that are not winter hardy.

Spring barley

Average spring barley yields are typically 40-60 bushels per acre. Management guidelines for planting date and soil drainage must be followed or spring barley yield potential will be low from late planting. Head emergence and grain filling during warmer weather for spring barley is often more conducive for fungal diseases.

Plant in well-drained fields with pH of 6.3 or higher

Plant malting barley on well-drained fields with a pH of 6.3 or greater. Compared to other small grains, malting barley is markedly less tolerant of wet soils and low pH. Malting barley should ideally be planted in soils that:

1. have good soil health and a well-drained texture (good infiltration and percolation potential),
2. are not subject to a persistently high-water table that inhibits drainage (despite well-drained soil textures), and
3. have a low chance for ponding (topography that allows for surface drainage). Winter barley can more commonly suffer from wet soils because of exposure to spring thaw conditions.

Malting barley should not be planted without first soil testing potential fields for pH and other plant nutrients.

Target planting in mid-September and early April for optimal stands

Planting date, rate, and seed depth are important to achieve your desired plant population. Winter barley should be ideally planted the second or third week of September. Spring barley should be planted in early April to strongly reduce summer weed pressure and maintain yield potential which drops by ~0.5-1 bushel per day after April 15th.

Plant malting barley at a rate of two bushels (96 lbs) per acre. Higher seeding rates may increase lodging, disease potential, and lead to smaller and more variable kernels.

Plant seed 1-1.5 inches deep with a grain drill. Shallow planting hinders proper root development; this is particularly crucial for winter barley. Do not broadcast seed of a malting barley crop as seed depth will be inconsistent and may result in stands that are too thick, thin, or variable.

Optimize fertilization to achieve yield and grain protein targets

Nitrogen fertility management is important for malting barley to yield well and meet malting quality standards. The protein content in malting barley should generally be >9% and <12.5%. Protein levels are dependent on available N. Targeting N fertility can be difficult though because of potential losses due to denitrification and leaching with high precipitation and variable soil drainage. Also, malting barley N fertility rates have not been thoroughly evaluated in the Northeast to date. Growers need to consider N contributions from previous crops, manure, and nitrogen fertilizer to preserve grain quality and avoid lodging. Given what is known for spring barley, apply 30-60 pounds per acre of N at planting. For winter barley apply 20-30 pounds per acre of N at planting in the fall and target 80-120 pounds of N per acre at green-up in early spring or split applied between green-up and stem elongation. Growers will need to adjust nitrogen rates for their situation to achieve the desired crude protein. Over-fertilizing with N can also make barley more prone to lodging. Because barley already has relatively soft straw, and our climate commonly has midsummer rain, dew, and wind that puts extra weight on grain heads, targeted N fertility is a key component of managing barley lodging. All other nutrients should be applied according to soil tests.

Reduce disease and mycotoxin risk through integrated management

Use integrated strategies to control Fusarium head blight, other diseases, and their effects on grain. There are no varieties with high Fusarium head blight resistance, though some possess moderate resistance. Management of Fusarium head blight requires an integrated strategy that includes less susceptible varieties, cultural practices, and fungicidal protection. Malting barley markets are very stringent about the DON (deoxynivalenol, aka, "vomitoxin") mycotoxin levels found in grains infected with *Fusarium*. Grain lots that test >1 ppm for DON concentrations are likely to be rejected for malting. The Fusarium head blight pathogen spreads mostly via spores in the air and is common because many grasses and corn are hosts. Barley should not be grown continuously, nor after corn or wheat, but in rotation with non-grass crops; planting barley into corn residues should especially be avoided. *Fusarium* infection occurs when there is persistent moisture on the heads from head emergence through the early grain formation stages. Fungicides to suppress Fusarium head blight should be applied when nearly all seed heads on the primary stems in a field have emerged from the boot. If weather conditions prevent fungicide application at this optimal timing, research has shown that fungicide application up to 7 days after full head emergence will still result in significant disease and toxin suppression, whereas fungicide application prior to head emergence has little benefit. For *Fusarium* suppression, only use labeled, recommended triazole fungicides (Caramba, Prosaro) at the full-labeled rate. Foliar fungal diseases, such as spot blotch, scald, powdery mildew, and leaf rust, may require management by planting varieties with resistance to specific diseases and/or by spraying labeled fungicides at appropriate timing for disease control. Fungicide products that include a strobilurin ingredient should not be applied after the flag leaf is visible to avoid an increased risk of DON mycotoxin accumulation in grain.

Utilize the best tools to manage weeds in your fields

Good weed control is essential to achieving high yields and allowing for the crop to be more easily combined and stored. Good pre-emergence weed control, timely spring seeding, strong crop competition (full, healthy, well-nourished stands), and weed seed bank control with herbicides and/or cultivation and crop rotations are important to managing weeds in northeastern grains. Herbicides such as 2,4-D and dicamba (Banvel, Clarity), bromoxynil (Buctril), and thifensulfuron + tribenuron (Harmony Extra) may provide annual broadleaf control. Pinoxiden (Axial XL) is labeled for annual grass control (ie. foxtail species) in spring barley. Pyrasulfotole + bromoxynil (Huskie) is also labeled for marestail control in winter barley. Read the label before use for specific rates, application timing, and weeds controlled. If using growth regulators such as 2,4-D and dicamba products, apply before stem elongation.

Weeds can also be controlled by cultivation with a tine weeder; typically, at least two passes are used, with one just before seedling emergence and another at the 3 to 5-leaf stage.

Timely harvest is essential to produce malt-quality grain

Maturing malting barley should be harvested as close to maturity as possible to reduce pre-harvest sprouting. Pre-harvest sprouting or "pre-germination" occurs when the grain has begun to mature and dry in the field but rain and/or dew is sufficient for the kernel to begin germinating. Do not allow barley to dry and then gain moisture before harvest if possible. Monitor diligently for physical signs of maturity (green color disappearance from glumes and peduncle, nodding grain heads) and target harvesting malting barley between 16-20% moisture if you have sufficient grain drying capacity. Allowing malting barley to field dry to the 12-13% kernel moisture level needed for long-term storage will lead to pre-harvest sprouting if excess moisture is present. A germination rate of ≥95% is desired for malting. Pre-harvest sprouting damage also limits the length of time the seed may be viable even if germination is 95% or better at harvest. Growers can also use varieties with resistance to pre-harvest sprouting in addition to timely harvest.

Precision drying, cleaning, and storage will sustain grain quality to end markets

Grain drying equipment, cleaning and storage are key tools for northeastern malting barley production. Malting barley production is often compared to certified seed production; barley kernels need to be high quality, uniform, clean, and most importantly - alive. Additional cleaning is usually needed to remove weed seeds and green matter that impart moisture and (sometimes) off- flavors. Access to at least a rotary cleaner is a must, but more cleaning equipment may be needed. Grain cleaning can also cull out diseased kernels that are often lighter than healthy ones. Lodged barley may also need to be cleaned to remove stones after harvest. Harvesting at higher moisture levels requires growers to have a robust grain-drying system that can move sufficient air and/or provide low-grade heat (≤100°F, no greater) if needed. Adequate cleaning, drying and storage should be lined up well before harvest.

For **more information,** consult Cornell University's malting barley website:

fieldcrops.cals.cornell.edu/small-grains/malting-barley

This publication was produced with support from the New York State Department of Agriculture and Markets, the Genesee Valley Regional Market Authority, the New York Farm Viability Institute, Cornell Cooperative Extension, and Cornell University School of Integrative Plant Science.

NEW YORK STATE OF OPPORTUNITY. Agriculture and Markets

NY farm viability INSTITUTE

Genesee Valley Regional Market Authority

Cornell Cooperative Extension

CornellCALS
College of Agriculture and Life Sciences