

## Production Guidelines for CHARLES: A New Two-rowed Winter Malt Barley

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The yield potential for winter barley significantly exceeds that of spring barley and may require less irrigation over the length of the growing season. In years where winter kill wasn't an issue, winter barley yields averaged over 25 bu/A more than spring barley (1997-2007) in Extension Variety Trials in southern and southeastern Idaho. The potential for increased yields in a winter malt barley variety should lead to increased profitability for growers over spring malt varieties. Currently, all winter barley varieties are feed types. The first release of a two-rowed winter barley with acceptable malt quality and brewing characteristics occurred in 2005, with the release of 'Charles' winter barley by the USDA-ARS, Aberdeen, ID, and the University of Idaho Agricultural Experiment Station (AES).

While production of winter malt barley will not be significantly different from the winter feed types, there are a few recommendations to improve production. Many of the production areas in southeast Idaho may not be conducive to winter survival, but it will depend heavily on the year. An open, cold winter with large temperature fluctuations will result in winterkill and / or root damage from frost heaving and eventual plant death. Winter barley is not as cold tolerant as winter wheat, nor does it have any tolerance to snow mold fungi, so the optimum areas of production for current varieties are southern Idaho and Magic Valley areas. Weigh your environmental conditions carefully. In the winters of 2006-07 and 2007-08, the damage to winter barley was severe, with stand losses in Aberdeen as high as 98%. In 2008-2009, there was little to no winterkill, and in fact, one producer east of Ririe obtained 150 bu/A yield of Charles.

### Planting Date

The planting date for Charles should be at least as early as you would plant winter wheat in your area. A large, healthy plant with a vigorous root system will be optimal going into cold weather. In southeast Idaho, that usually means planting earlier than or by September 10<sup>th</sup> to the 15<sup>th</sup>. In the Aberdeen area, planting recommendations are by September 20<sup>th</sup>. In south central Idaho and the Magic Valley area, the planting date can be as late as October 15<sup>th</sup>, and similar to the planting window for Northern Idaho. With unpredictable winters in areas north of Pocatello and Aberdeen, a significant risk of damage from winter kill and spring frosts may

severely limit successful production. Planting too early, on the other hand, may increase the risk of having the crop in a growth stage vulnerable to frost damage, especially at flowering.

### Seeding Rate

If planting winter malt barley early or at the normal planting window for winter wheat, the recommended seeding rate is 600,000 to 800,000 live seeds per acre. In order to calculate seeding rate on a per pound basis, it is helpful to know the thousand kernel weight. As an example, for the University of Idaho winter barley variety trials, the seeding rate varied from 62-81 pounds per acre in order to achieve a rate of 800,000 seeds per acre. Seeding heavier may result in improved stand in the spring, but higher planting densities do not always translate into higher yields. Barley has a remarkable tillering capacity, and dense stands often result in lodging and no yield improvements, and very high seeding rates will result in yield reductions. If you are planting later than the optimum date for your area, then the seeding rate should be increased to 800,000 to 1,000,000 live seeds per acre.

### Seedbed Preparation

An excessively light and heavily worked seed bed may result in plants prone to frost heaving. Do not overwork the soil, and ensure good seed to soil contact with heavy pressure from the press wheels. Do not plant deep, and irrigate to get optimal and even growth prior to the onset of cold temperatures. An even stand will pay off with improved weed control.

In areas and years where winterkill could be a problem, winter survival has been improved by planting winter barley in a furrow, protected by a ridge of soil that is in the opposite direction of the prevailing wind. This does mean planting in wider rows, but the increased survival and plant size of the surviving winter barley means yield increases of 20-100 bushels per acre over conventionally drilled winter barley when winter kill is an issue.

### Fertility

Fertilize as you would for spring malt barley. Get a soil test in order to have an accurate estimate of residual nitrogen, and add additional nitrogen to meet the general recommendation of 1.8-2.0 lbs of N per bushel of expected yield. Reducing nitrogen inputs to 1.2 lbs of N per bushel will significantly decrease lodging; however you may have grain protein lower than required for contracted specs. If you are following a previous grain crop where the stubble has been incorporated into the soil, add an additional 15lb N per acre for every ton of straw residue (up to 50 lbs N per acre). If possible, in-furrow application of phosphorus (20-30 lbs P<sub>2</sub>O<sub>5</sub>/A) and a small amount of nitrogen (5-10 lbs N/A) will promote vigorous seedling growth and help the plants resist disease. Splitting the nitrogen application between the fall and spring may reduce N loss from winter snow and spring rains.

### Spring Die-Off

Winter barley is not frost tolerant once growth resumes in the spring. Low-lying areas where cold temperatures pool may suffer frost damage, so try to avoid areas prone to more frequent frosts, like low fields close to a river. Those winter-killed and frost damaged areas will also be

prone to excessive weed development in the spring. There are Crop Insurance Options available for Winter Protection, with a malt barley endorsement available as an add-on. See “Winter Barley Crop Insurance Options in Charles Malting Barley” below.

## Weed Control

The best weed control is consistent, integrated weed control in the entire crop rotation. While weed control principles and chemistries are the same in winter barley as it is in spring barley, weed pressure may increase in those areas where winterkill and spring die-off create open spaces. To optimize grain quality and yield, controlling weeds is an essential part of maximizing economically viable production.

## Plant Growth Regulators

The higher the seeding rate, the higher the nitrogen fertility and the greater the irrigation, the more likely it is that you will have lodging. If you tend to push production in spring malt varieties and find that plant growth regulators significantly reduce lodging, then consider applying growth regulators to your winter barley. Winter barley does not tend to lodge as severely as spring malt barley, but with excessive amounts of nitrogen fertilizer, you will have lodging. Know your soil fertility levels, and do not over apply nitrogen.

## Diseases

Promote plant health with in-furrow fertilizer to improve seedling vigor. Managing your irrigation for optimal growth will also reduce plant stress and reduce the opportunity for diseases. Plant winter barley in rotation with other crops to reduce those diseases prevalent in continuous grain. Try not to plant barley or wheat following corn, which favors the development of Fusarium head blight (also called head scab) and results in diseased kernels and the accumulation of fungal toxins in the harvested grain.

Winter barley has no resistance to stripe rust or to barley scald. In most years, these diseases do not cause damage or yield losses. However, in spring seasons where the environment is conducive, these diseases may cause up to a 50% yield loss. It is recommended to scout fields regularly for disease, and in years when disease development is favored by unusually high rainfall, it may be economically beneficial to spray fungicides to reduce yield loss.

## Harvesting

Winter barley may be prone to skinned and broken kernels. Slow the cylinder in the combine and open it up to reduce kernel damage.

## Winter Barley Crop Insurance Options for Charles Malting Barley

Feed Barley Insurance with Winter Protection is currently available in three Idaho counties: Nez Perce (north), Payette (western) and Cassia (south central). The Malt Barley Endorsement is available to add on to this winter feed barley coverage to insure your malting barley crop at the higher contract value.

Producers in other counties who are growing eligible winter varieties, like Charles malting barley, can enter into a Written Agreement to secure special coverage for winter kill protection.

Producers who want to take winter coverage should contact their insurance agents and make a request to enter into a Written Agreement by the winter insurance sign-up deadline of September 30. If you have questions, contact Kelly Olson, Idaho Barley Commission in the Boise office, 208-334-2090, kolson@idahobarley.org

## Questions

For additional questions, call a University of Idaho Cooperative Extension representative, or Juliet Windes at 209-529-8376, or the Idaho Barley Commission at 208-334-2090.

Table 1. Examples of seeding rate, yield and test weight from producers growing Charles winter barley in 2008-2009. Do not base expectations on one year's worth of data.

Eastern Idaho			South-Central Idaho			North Idaho		
Seeding rate	Yield	Test Weight	Seeding rate	Yield	Test Weight	Seeding rate	Yield	Test Weight
lbs/A	bu/A	lbs/bu	lbs/A	bu/A	lbs/bu	lbs/A	bu/A	lbs/bu
100	150	49	75	149	48	85	104	45
100	120	45	75	164	52	90	60	-
100	132	46	100	150	48	100	100	-
130	120	45	105	150	45			
135	81	41	107	140	-			

## The Authors

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