

## 2-ROW BARLEY



In the Yuma area, barley is grown on roughly 1500 acres and in 2007, was valued at \$0.5 million. It is grown as a source of animal feed and used in making beer. Yuma grown barley is a reasonably fast growing and early maturing grain crop, averaging about 50 days from seed to harvest.

In England, barley straw is placed in mesh bags and floated in fish ponds or water gardens to help reduce algal growth without harming pond plants and animals. Barley straw has not been approved by the EPA for use as a pesticide and its effectiveness as an algaecide in ponds has produced mixed results during university testing in the US.

About half of the United States' barley production is used as an animal feed. Barley is an important feed grain in many areas of the world not typically suited for maize production, especially in northern climates. Barley is the principal feed grain in Canada, Europe, and in the northern United States.

A large part of barley production is dedicated for malting, for which barley is the best suited grain. It is a key ingredient in beer and whisky production. Two-row barley is traditionally used in German and English beers. Six-row barley was traditionally used in US beers, but both varieties are in common usage now.

Distilled from green beer, whisky has been made from barley in Ireland and Scotland, while other countries have utilized more diverse sources of alcohol; such as the more common corn, rye and molasses in the US. The grain name may be applied to the alcohol if it constitutes 51% or more of the ingredients.

Non-alcoholic drinks such as barley water and barley tea (called mugicha in Japan), have been made by boiling barley in water. Barley wine was an alcoholic drink made in the 1700s, prepared from recipes of ancient Greek origin. It was prepared by boiling barley in water, the water from the barley was then mixed with white wine, and other ingredients like borage, lemon and sugar were added.

Barley contains all eight essential amino acids. According to a recent study, eating whole grain barley can regulate blood sugar for up to 10 hours after consumption compared to white or even whole-grain wheat, which has a similar glycemic index. Barley can also be used as a coffee substitute.

Hulled barley (or covered barley) is eaten after removing the inedible, fibrous outer hull. Once removed, it is called dehulled barley (or pot barley or scotch barley). Considered a whole grain, dehulled barley still has its bran and germ making it a nutritious and popular health food. Pearl barley (or pearled barley) is dehulled barley which has been steam processed further to remove the bran. It may be polished, a process known as "pearling". Dehulled or pearl barley may be processed into a variety of barley products, including flour, flakes similar to oatmeal, and grits.

Barley-meal, a whole meal barley flour which is lighter than wheat meal but darker in color, is used in porridge and gruel in Scotland. Barley-meal gruel is known as Sawiq in the Arab world. With a long history of cultivation in the Middle East, barley is used in a wide range of traditional Arabic, Kurdish, Persian, and Turkish foodstuffs including kashk and murri.

Barley soup is traditionally eaten during Ramadan in Saudi Arabia. It is also used in soups and stews in Eastern Europe. In Africa, where it is a traditional food plant, it has the potential to improve nutrition, boost food security, foster rural development and support sustainable agriculture.

Barley grains were used for measurement in England, there being 3 or 4 barley kernels to the inch and 4 or 5 poppy seeds to the barley kernel. The statute definition of an inch was 3 barley kernels, although by the 19th century this had been superseded by standard inch measures. This unit still persists in some shoe sizes in Britain.

Known in Arabic as At-Talbina, barley was narrated in Islam that it helped people who lose others to death and controls grief. Illnesses include high cholesterol levels, heart disease, treatment of cancer and slowing of age, treatment for diabetes and hypertension. Avicenna in his 11th century work *The Canon of Medicine* wrote of the healing effects of barley water, soup and broth for fevers.

Barleys are annual grasses that have been domesticated for over 1000 years. And beer lovers contribute to the fact that about 60% of all barley grown in the US is used in malt production for the domestic beer market.

Barley grown for brewers' malt is called malting barley, as opposed to feed barley, and is divided into two general types: 2-row and 6-row. The most obvious difference between a head of 2-row barley and a head of 6-row barley is the arrangement of the kernels when the head is viewed down its axis.

Brewers typically are not too concerned about 2-row versus 6-row barley based on the appearance of the barley head. However, the significant differences are found upon closer examination. In general, 6-row malted barley has more protein and enzyme content than 2-row malted barley, is thinner than two-row malt and contains less carbohydrate. There are also flavor differences between 2-row and 6-row and it seems that most brewers feel 2-row malt produces a fuller, maltier flavor and 6-row malt produces a grainier flavor in the finished beer.

Barley is the most common starch source used in beer. The grain is malted by soaking it in boiling water and allowing it to begin "germination", and then drying the partially germinated grain in a kiln. Malting grain produces enzymes that convert starches in the grain into fermentable sugars. By roasting the grains for different lengths of time and at different temperatures, they will produce different colors of malt from the same grain.

In the US, a wide range of malting barley varieties is grown, including both 2 row and 6 row. Many craft brewers believed that two row barleys are the best barleys for malting and brew-

ing. In fact, most of the world's brewing nations exclusively use 2 row barley for beer making.

Two-row barley is the oldest form, wild barley having two rows as well. Two-row barley has a lower protein content than six-row barley and thus more fermentable sugar content. High protein barley is best suited for animal feed. The best barley for malting is usually lower in protein content.

Two-row barley is traditionally used in English ale style beers. Six-row barley is common in some American lager style beers, especially when corn and rice are also used.

Recent genetic studies have revealed a mutation in one gene, *vrs1* is responsible for the transition from two-row to six-row barley.

Hulless or "naked" barley is a genetically improved variety that has an easier to remove hull. A fairly new industry has developed around uses of selected hulless barley in order to increase the digestible energy of the grain, especially for swine and poultry. Hulless barley has been investigated for several potential new applications as whole grain, and for its value-added products. These include bran and flour for multiple food applications.

Kurt Nolte is an area agriculture agent with the Yuma County Cooperative Extension. He can be reached at 928-726-3904.