

Buckwheat – Friend to Phosphorus and Infertile, Acidic Soil

Buckwheat (*Fagopyrum esculentum*) is a plant cultivated for its grain-like seeds and as a cover/forage crop. Common buckwheat was most likely domesticated in the western Yunnan region of China and first cultivated in inland Southeast Asia, possibly around 6000 BCE. From there it spread to Central Asia and Tibet, and then to the Middle East and Europe.

Our Resilient Farms Agronomist, Jade Killoran, says:



“Buckwheat is a summer active broadleaf, which germinates and establishes very readily, making it a good ground covering species in a multispecies mix. Buckwheat is well known for making phosphorus more available in the soil. It is sown at 2-5 kg/ha in a multispecies mix and while it looks similar to many broadleaves in the seedling stage, it has a red stem, making it identifiable. Buckwheat is a very good pollinator species, with attractive flowers which vary from white or light green to pink

or red. Buckwheat is cold sensitive, so is best sown mid-late spring onwards, or in early autumn mixes where it will establish and grow before self-terminating usually with the first frost in winter.”

Increases soil phosphorus and handles high pH

Buckwheat is often called a phosphorus (P) “scavenger” because it can take up soil P more efficiently than other plants. In its growing stage, the roots of buckwheat exude substances that help to solubilize P that may otherwise be unavailable to plants. Roots residues make phosphorus more available to the next crop and return considerable levels of phosphorus to the soil.

Buckwheat grows on a wide variety of soil types, including infertile and acidic soils (pH 4–6). It does not do well in compacted, dry, or excessively wet soils and thrives in cool, moist climates. Too much fertiliser – especially nitrogen – reduces the growth of buckwheat.



Weeds, Worms and Wellbeing

The buckwheat plant has some allelopathic properties that prevent weed development. Spreading 2 t of buckwheat pellets before rice plantation was found to reduce weeds by 80% in rice fields and to increase rice yield by 20%. Buckwheat decreases disease load. It is reported to have prophylactic values, such as an anthelmintic effect when fed to livestock. (Feedipedia)

Buckwheat for forage

Although buckwheat is primarily grown for its grain, it is an excellent addition to a mixed species pasture crop. The whole plant can be grazed, or cut and fed in different forms - fresh, hay or silage. Buckwheat straw, the crop residue obtained after the grain has been harvested, is often used for bedding but can be used as fodder. Buckwheat stover (stubbles) are the leftovers that can be grazed in the field after grain harvest. It is also used as green manure. In Bhutan, buckwheat crop residues can be an important feed.



Fagopyrism (photosensitisation) has been observed in cattle and sheep (cf. Health and Medicine section below) but will not affect stock in the small quantities of a pasture seed mix.

Illustration of Buckwheat in the “Seikei Zusetsu”, a Japanese agricultural encyclopedia compiled between 1793 to 1804.

Vital Statistics for Buckwheat

Dry Matter Yield – 1.36 tonnes per acre

Nitrogen uptake – 8 kg per tonne dry matter

Roots – Dense, fibrous system with deep taproot concentrated in top 25cm of soil.



What the buck?

Despite its name, buckwheat is not closely related to wheat. It is not a cereal, nor is it even a member of the grass family. Buckwheat is related to sorrel, knotweed, and rhubarb, and is known as a pseudocereal because its seeds' culinary use is the same as cereals, owing to their composition of complex carbohydrates.

The name "buckwheat" or "beech wheat" comes from its triangular seeds, which resemble the much larger seeds of the beech nut from the beech tree, and the fact that it is used like wheat.



Buckwheat seeds resemble beech nuts – hence the name.

Highest crop

Buckwheat is the world's highest- elevation domesticate, being cultivated in Yunnan on the edge of the Tibetan Plateau or on the plateau itself. (Wikipedia) Buckwheat was one of the earliest crops introduced by Europeans to North America. Dispersal around the globe was complete by 2006, when a variety developed in Canada was widely planted in China. In India, buckwheat flour is known as *kuttu ka atta* and has long been culturally associated with many festivals like, Shivratri, Navaratri and Janmashtami. On the day of these festivals, food items made only from buckwheat are consumed.

Follow the buck...

In 2017, world production was 3.8 million tonnes, led by Russia with 40% of the world total, followed by China with 38% and Ukraine with 5%.

During the 18th and 19th centuries, buckwheat was a common crop in the northeast United States but declined sharply by the mid-20th century because of the use of nitrogen fertilizer, to which maize and wheat respond strongly. Total crop area was 2.5 million ha in the US in 1961, but it was down to 1.44 million ha by 2010 ([Jacquemart et al., 2012](#)). However, buckwheat cultivation in the US has increased in recent years because of the popularity of “ancient grains” and a growing market for gluten-free products.



Meat of the Fields

Buckwheat is a favourite food in Japan where it is often referred to as “meat of the fields” due to its numerous nutrients including high levels of minerals, vitamins and essential amino acids especially lysine which appears to help the body absorb calcium and plays an important role in the formation of collagen. It is also a great source of fibre and gluten free.

With a 100-gram serving of dry buckwheat providing 1,440 kilojoules (343 kilocalories) of food energy, or 380 kJ (92 kcal) cooked, buckwheat is a rich source (20% or more of the Daily Value, DV) of protein, dietary fibre, four B vitamins and several dietary minerals, with content especially high (47 to 65% DV) in niacin, magnesium, manganese and phosphorus (table). Buckwheat is 72% carbohydrates, including 10% dietary fibre, 3% fat, 13% protein, and 10% water.



Buckwheat growing in the Himalayan kingdom of Bhutan.

A cure for cancer?

According to Wikipedia, buckwheat contains diverse phytochemicals, including rutin, said to improve cardiovascular health, tannins, catechin-7-O-glucoside which acts as an antioxidant leading to a cytoprotective effect, and fagopyrins, which are located mainly in the cotyledons (seed leaves) of the buckwheat plant.

Fagopyrins, as the name suggests, are specifically found in buckwheat and are defined as “any of a group of fluorescent red pigments that cause hypersensitivity to sunlight if ingested.” Fagopyrism (symptoms include skin inflammation in sunlight-exposed areas, cold sensitivity, and tingling or numbness in the hands) can appear in people with diets based on high consumption of buckwheat sprouts, and particularly flowers or fagopyrin-rich buckwheat extracts. However, fagopyrins may have a role to play in curing various illnesses including cancer. UV–vis absorption spectra of fagopyrins are similar to that of hypericin, which is known to have anti-inflammatory, anti-depression, anti-viral, and anti-microbial activities and is used as a photodynamic therapy agent (Karioti and Bilia, 2010). Photodynamic therapy uses a drug that is activated by light, called a photosensitiser or photosensitising agent, to kill cancer cells.



Gluten-free Groats – Alternative Oats

Buckwheat groats (whole-grain kernels of grains) are commonly used in western Asia and eastern Europe. Groats were the most widely used form of buckwheat worldwide during the 20th century, eaten primarily in Estonia, Latvia, Lithuania, Russia, Ukraine, Belarus, and Poland, called *grechka* (Greek [grain]) in Belarusian, Ukrainian and Russian languages.

Buckwheat noodles have been eaten in Tibet and northern China for centuries, where the growing season is too short to raise wheat. A wooden press is used to press the dough into hot boiling water when making buckwheat noodles. Old presses found in Tibet and Shanxi share the same basic design features. The Japanese and Koreans may have learned the making of buckwheat noodles from them.

Buckwheat noodles play a major role in the cuisines of Japan (*soba*) and Korea. *Soba* noodles are the subject of deep cultural importance in Japan. The difficulty of making noodles from flour with no gluten has resulted in a traditional art developed around their manufacture by hand. A jelly called *memilmuk* in Korea is made from buckwheat starch.

Noodles also appear in Italy, with *pasta di grano saraceno* in Apulia region of Southern Italy and *pizzoccheri* in the Valtellina region of Northern Italy.



Buckwheat hulls are used as filling for a variety of upholstered goods, including pillows and zafu.

Buckwheat (left), buckwheat flakes (right), and crispbread made of buckwheat flour. (Google commons)

Buckwheat Beverages

Buckwheat shōchū is a Japanese distilled beverage produced since the 16th Century. The taste is milder than that made with barley. Buckwheat whisky is produced in the Brittany region of France and in the States. In recent years, buckwheat has been used as a substitute for other grains in gluten-free beer. Buckwheat tea, known as *kuqiao-cha* in China, *memil-cha* in Korea and *soba-cha* in Japan, is made from roasted buckwheat. In answer to last week's teaser, buckwheat is NOT made into wine.

