
Multifarious uses of Buckwheat (*Fagopyrum* spp.)

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ABSTRACT

Buckwheat (*Fagopyrum esculentum*) originated in the Tibetan Plateau or nearby mountain of Yunnan, SW China. It is associated with the Family Polygonaceae and comes under the category of dicot pseudo-cereals which is quite different from monocot cereals. In India two species of buckwheat i.e *F.esculentum* and *F.tataricum* are commonly cultivated. It is Gluten free Super food which is rich in vitamins B1, B2, E, protein, fibres, carbohydrates and minerals. Among its health benefits it may improve heart diseases, promote weight loss, helps in sugar control and an alternative for Celiac disease. However, cereal products are deficient in lysine and protein contents which are high in this crop. It performs multiple functions such as green manure crop, nutrient conserving crop, break crop, smother crop and as land reclamation crop. Generally, people during religious fasting days consume many products made out of this crop in India. The grains and flour is used in making chapattis, biscuits, noodles etc. It has the potential to suppress insect-pest life cycle and also root pathogens in soil. It has Rutin and Fagopyrin which helps in curing various human diseases such as hemorrhage, edema, purpura, kidney disorders, carcinogenic and stabilizes high blood pressure.

INTRODUCTION

Buckwheat (*Fagopyrum esculentum*) is associated with the Family Polygonaceae and comes under the category of dicot pseudo-cereals and is quite different from monocot cereals. It is an important crop of temperate region and grown for grains and green leaves. This can be grown

successfully in the higher Himalayan region upto 4500 m. In India two species of buckwheat i.e *F. esculentum* and *F. tataricum* are commonly cultivated. However, it is an underutilized and neglected crop and has many advantages for growers and consumers. It is a climate resilient crop grown under environmental stress conditions. It is a short duration multipurpose crop. It has short growing season and well suited to high hill rainfed ecosystems. It is also a suitable crop for aberrant weather situation as contingency crop. It has good source of fibre and niacin which improves cholesterol level, heart diseases, improve digestive system, prevents weight gain, and manages sugar level. Farmer also use it for livestock feed.



Field View of Buckwheat Crop and Flowers

Its grains are rich source of dietary starch, proteins, vitamins and micro nutrients. Hence, it is a good supplement for children and women. Moreover, it is a good source of Rutin and Fagopyrin which is used for curing various human diseases. The multipurpose uses of Buckwheat can be characterized as follows,

1) BUCKWHEAT AS BODY BUILDING/PROTECTIVE/QUALITY FOOD

This Super food contains 10–14% proteins higher than most of the cereals and its proteins are of superior quality than cereals due to high concentration of essential amino acids. The lysine and protein contents are high in this crop which is deficient in cereal products. Prolamins content in buckwheat grain is very low as compared to cereals including wheat. Tartary buckwheat has high tannin content and hull percentage. Grains of buckwheat are rich in trace elements like Zn, Cu, Mn and Se as compared to cereal crops and flour is Gluten free.

2) BUCKWHEAT AS SOIL PRODUCTIVITY RESTORING CROP

It performs many functions such as green manure crop, smother crop, nutrient conserving crop, break crop, gourd crop, cover crops and as land reclamation crop. The seeds germinates in 3–5 days, flowers in 30–45 days and matures in 90–110 days. It reaches a height of 70–80 cm and produces about 5–7 tonnes of biomass/ha. The biomass production largely depends on the growth stage at which crop is incorporated into the soil. Early flowering or late vegetative stage is the right stage for green manuring. The stuble left on the surface helps in maintaining soil stability and reduces weeds. It improves soil stability and scavenges nutrients especially phosphorus and calcium. However, when residue of crop is incorporated into the soil, it releases nutrients for uptake by the subsequent crop especially potassium. Besides, it has the potential to suppress insect-pests life cycle and root pathogens.

3) BUCKWHEAT FOR SUSTAINING LIVELIHOOD SECURITY OF HILL REGIONS

Seeds and husks of this crop are used for different purposes. Generally, people during religious fasting days consume many products made out of this crop in India. The grains and flour is used in making chapattis, biscuits, noodles etc. It is also used as livestock, poultry and piggery feeds. However, tartary buckwheat is used in place of tea in hilly areas and green/fresh straw is fed to cattle after threshing.



Buckwheat Noodles



Buckwheat Puri



Buckwheat Cookies



Buckwheat Cakes



Buckwheat Sprout



Buckwheat Bread

4) BUCKWHEAT AS “NATURAL PHOSPHORUS PUMP”

It is a natural phosphorus pump having phosphorus uptake 10 times higher than wheat. It produces residues with less pH in phosphorus deficient soils. Similarly, it has high P-uptake efficiency in calcareous soils and is less effective in soils dominated by Fe and Al phosphates. As a result, when buckwheat plants are incorporated into the soil, they decay quickly, making phosphorus and other nutrients available to the succeeding crop. Under the phosphorus deficient conditions, buckwheat root increases the release of protons and phosphorus solubilizing substances and enhances phosphorus uptake. Roots exudates of buckwheat contains several mild acids such as phosphatases which further mineralizes the slow release of organic fertilizers like rock phosphate and thus available to the succeeding crop.

5) BUCKWHEAT AS MEDICINAL PLANT

Rutin present in buckwheat is used in curing edema, haemorrhagic diseases and stabilizes high blood pressure. However, rutin content in buckwheat foliage ranges between 3–6% of dry weight. Generally Tartary buckwheat contains about 100 times more rutin than common buckwheat. This is mainly located in flowers and in green parts of buckwheat plant and less in seeds than in leaves.

Fagopyrin is a naphthodianthrone substance with photosensitizing effect and exclusively found in cotyledons. The photosensitizing effect of Fagopyrin is recently used in the treatment of microorganism and cancer cells. Peoples of hilly region of India eat buckwheat sprout in breakfast which prevent hypohemia in human beings. Tartary buckwheat can be processed into different kinds of Teas which help in reducing blood pressure and lowering sugar and lipid level. In north-east India Farmer's traditionally use Tartary buckwheat to cure livestock suffering from foot and mouth disease.

CONCLUSION

Buckwheat with its high quality protein balanced with amino acids is an indispensable protein source for the human beings. Its grain is full of dietary fibre, lipids, minerals and vitamin especially P, E and B complex with high rutin and fagopyrin content having various medicinal properties. Hence, buckwheat is a Super food for human beings. It is, thus, advisable that buckwheat should be a part of agricultural production system in order to maintain nutritional standards and can be the future food crop for feeding mankind.