

# BLACK WHEAT FARMING

Miraan Mallick<sup>1</sup> and Sayan Sau<sup>2</sup>

<sup>1</sup>Department of Genetics and Plant Breeding, Lovely Professional University.

<sup>2</sup>Department of Agronomy, Lovely Professional University.

## INTRODUCTION

Wheat is one of the major cultivated crop around the globe. This grass (gramineae) family cereal plays a pivotal role in the human diet, as it is taken as the staple food. According to FAO report the amount of wheat production in the world is about 765.7 million tonnes in 2019. Black wheat is a type of pigmented wheat variety which shows the dark colour on its outer cover (pericarp). Aside this black wheat there is also red wheat, blue wheat, purple wheat. All those colour are due the presence of anthocyanins. This black coloured wheat is now making headlines for its nutritive value. Different studies proves that the health benefits of this is way much better than the conventional yellow wheat variety in aspect of protein content, essential amino acids availability gluten index of its flour etc.



## DISCOVERY SCENARIO:

The black grain wheat is developed by the institute of crop genetics, Shanxi academy of agricultural science after investing their 20 years of time and endless effort. The invention of black grain wheat happened after crossing of one blue purple hexaploid wheat variety (blue purple 114) and a purple colored hexaploid wheat variety (purple 12-1). The first produced black grain variety is named as 'black 76'.

In India black wheat variety was first prepared after 7 long years of work and dedication of Dr. Monika Garg at National Agri-Food Biotechnology Institute (NABI), Mohali. They crossed the Japanese variety (EC866732) with the high yielding cultivar of wheat PBW621. The variety was named as 'NABI MG'.

## BLACK WHEAT FARMING IN INDIA:

The farming strategy of black wheat is almost same to the normal wheat. At the early stage of growing black wheat it also appears with green stem and grain but in grain maturity stage it shows the blackish appearance in it. The grain matured fully in 130-135 days in the Indian climatic condition when it requires harvesting. It gives lower yield and small grain size as compared to the normal wheat. Its seed is still not available that much in the seed stores for local farmers, but it available in NABI. It is still not that much popular among the farmers probably because of its low yield. Though the cultivation of it is started in some areas of Madhya Pradesh, Punjab, Haryana, Gujrat.



## WHERE IT DIFFERS FROM THE YELLOW WHEAT:

Black grained wheat differs from the conventional wheat not only in the outer appearance but in the inner layers like aleurone layer, pericarp and also in the essential nutrient availability. The wheat caryopsis is made up of two main parts pericarp and seed. The pericarp is the outer most layer of the grain and seed is the inner one. In case of structural difference the black wheat differs in layers like the outer endosperm layer (aleurone layer) which is the only living part of the grain, contains blue pigment and the pericarp contains purple pigment but the testa of both type of wheat doesn't contain any amount of anthocyanin so both shows the same colour. Anthocyanin content of normal wheat grain is 5 ppm where in case of black wheat it is around 100-200 ppm.

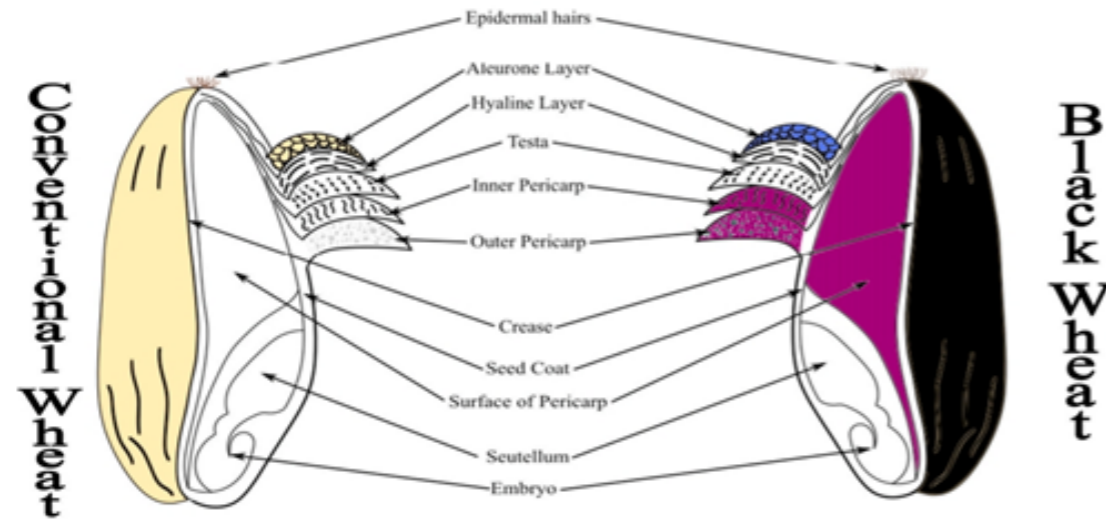


Fig: Structural difference between conventional and black wheat. (Source: Dhua et al. 2021)

## CONCLUSION:

Black wheat is the result of biofortification, its nutrient availability is really impressive. Appropriate gluten index of it is attractive but it still needs some efforts for increasing its productivity to match the future food need as wheat is a staple crop. Till date only a few varieties of black wheat is only evolved. Modern genetic approaches like genetic engineering and new breeding techniques should be used for improving its disease and pest resistant varieties.



## ADVANTAGES AND HEALTH BENEFITS:

- 75% of the total carbohydrate content is present only in the endosperm of the black wheat and the protein content of black grain wheat is 10-15% higher than the normal wheat.
- It contains carbohydrate 62.10%, crude protein 20.50%, crude fiber 2.40%, lipid 1.60% and ash 1.90% in it.
- It also contains arabinoxylan which is a non starch polysaccharides, dietary fiber, sugar, structural polymers like lignin, cellulose.
- Some essential amino acids, vitamins (vitamin E, vitamin B3 and B5, vitamin K) and minerals (zinc, iron, copper, calcium and phosphorus) are also present among those zinc and iron concentration needs special mention.
- Black wheat grain helps in body building and maintaining the water balance of the body.
- The presence of unsaturated fatty acid helps in release the cardiovascular problem by improving the heart health.
- Relieving the problem of constipation, fecal bulking and large bowel protection.

## DRAWBACKS AND FUTURE NEEDS:

- The major constraint of black wheat production is its low productivity in compare to conventional wheat varieties it lowers almost 10 quintal per hectare. It need selection of proper traits for better production.
- Adaptability in different climatic region is also a very important factor for becoming popular in India because India possesses different climatic zones.
- In case of disease and pest resistivity black wheat also need some good research support for better performance in terms of yield.
- Aside those black wheat also needs good extension work and initiative from government to become popularize among the farmers.