

Study of grain shape, color and pre-harvest sprouting in population of winter bread wheat cultivated in Russia

Afonnikova S.D., Kiseleva A.A., Fedyaeva A.V., Afonnikov D.A., Salina E.A.

Federal Research Center Institute of Cytology and Genetics, Siberian Branch of Russian Academy of Sciences, Novosibirsk, Russia

E-mail: svetaafonnikova@gmail.com

Grain color and shape of bread wheat can affect yield, quality of flour characteristics and the nutritional value of the final product. Moreover, it was shown that grain color correlates with tolerance to pre-harvest sprouting (PHS), a process leading to a loss of yield and product quality decrease. Hence, the search for genetic variants responsible for grain color and shape is an urgent task of modern breeding.

We have analyzed single nucleotide polymorphisms and characteristics related to grain properties in winter wheat plants cultivated in Russia, Europe and America from the ICG SB RAS collection: grain size, shape and color, Growth index, α -amylase activity and Falling Number. The correlation analysis of traits showed significant correlation between α -amylase activity in mature grains and some both size and color traits. Population structure analysis showed that European and American genotypes form several distinct genetic groups.

The results obtained will be used in genome-wide association analysis to find candidate genes linked to traits of interest.

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Take-home message:

In population of winter bread wheat significant correlations between pre-harvest sprouting estimates and grain color and shape were observed only for α -amylase activity.

The studied population (170 samples) genetic structure is heterogenous.

