

The study of the influence of various factors on the germination index in the collection of soft winter wheat (*Triticum aestivum* L.

Fedyaeva A.V., Afonnikova S.D., Afonnikov D.A., Deeva V.N.*, Pryanishnikov A.I.,
Salina E.A.**

Institute of Cytology and Genetics of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia,

*LLC NPO «Betagran-Semena», vil. Dobryy, Russia,

**Department of Breeding and Seed Production of Agricultural Crops, Schelkovo Agrohim, Schelkovo, Russia

E-mail: fedyaeva.anna@mail.ru



Pre-harvest sprouting leads to significant economic losses. The red-grain varieties wheat are more resistant pre-harvest sprouting than white-grain varieties wheat. Red color in wheat is controlled by the dominant alleles of the grain color genes (*Tamyb10*). The purpose of this study is to investigate 169 varieties of soft winter wheat for pre-harvest sprouting resistance. In this study were used different methods, such as determination of the germination index (GI), α -amylase (AA) activity, and falling numbers (FN); assessment of grain color using the SeedCounter application, PCR analysis to determine *Tamyb10* alleles.

The analysis showed that there is a negative correlation between GI and FN, as well as between FN and AA activity. The study of allelic variants of the *Tamyb10* gene showed that the presence of even one dominant allele in one of the three wheat subgenomes A, B and D leads to a significant decrease in the germination index, and thus pre-harvest sprouting resistance.

This research was funded by the RSF (Russian Science Foundation) project No. 21-76-30003.

The main publications of authors on the subject of the abstract:

Федяева, А.В., Салина Е.А. Оценка полиморфизма коллекции озимой пшеницы по устойчивости к прорастанию зерна на корню // Генофонд и селекция растений : Сборник матер. 6-й Межд. конф., Новосибирск, 23–25 ноября 2022 года. – С. 202-205.

Федяева, А.В., Салина Е.А., Шумный В.К. Факторы, влияющие на прорастание зерна на корню у мягкой пшеницы (*Triticum aestivum* L.), и методы их оценки // Генетика. – 2023. – Т. 59, № 1. – С. 5-17. – DOI 10.31857/S0016675823010058.

Take-home message:

The relationship between the germination index (GI), α -amylase activity, falling numbers (FN) and the dominant alleles of the gene *Tamyb10* (Tam) which determining wheat grain red color in 169 wheat varieties was studied.

