Study of species-specific traits and earliness in wheat of different levels of ploidy

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The efficiency of automated phenotyping of wheat species based on the morphology of spike can be improved by introduction of IT technologies for digital image analysis.

The purpose of study is to identify the inheritance of taxonomically significant (classification) traits in di-, tetra- and hexaploid wheat species for a build database (DB).

Materials and methods. As a material were taken 26 wheat species of different ploidy levels. Hybridization of tetraploid wheat species was carried out and hybrid forms F_1 and F_2 were obtained.

Results. The following signs of the studied species were introduced into the DB: speltoidness, compactness, roundness and branchiness, presence of awns, earliness. Most interest are also signs of tetraploid wheat species that require further study. As a result of the conducted research, algorithm has been compiled that allows predicting the type of ploidy. Then information was entered into DB and was be basis for development of a neural network.

Conclusions. By use designed DB, in plans to create a classifier based on the species-specific characteristics of wheat plants.

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

1. Genaev M.A., Komyshev E.G., Kruchinina Y.V. et al. Morphometry of the wheat spike by analyzing 2D images //Agronomy ISSN: 2073-4395 2019г (Q1)

2. Komyshev E., Kruchinina Y., Genaev M. et al. Spikes morphometric characteristics analysis of five species of wheat // Bioinformatics of genome regulation and structure / Systems Biology (BGRS/SB-2020) The Twelfth International Multiconference Abstracts. 2020 : Institute of Cytology and Genetics, SB RAS – 324

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