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FEATURES OF WINTER RESISTANCE OF COLLECTIONS SAMPLES OF WINTER WHEAT IN THE CONDITIONS OF THE NORTHERN FOREST-STEPPE

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At present, the actuality of the problem of creating a new winter wheat varieties with high productivity and stability has increased significantly. One of the ways to solve it is to improve the winter resistance of genotypes, in which this feature must be realized at the minimum level required for a particular region.

The purpose of research was to establish the peculiarities of the winter resistance of collections samples of winter wheat in the conditions of the northern part of the forest-steppe of Ukraine for use in the breeding process when creating a new source material.

Materials and methods of the research. The research was conducted during 2011-2016 in the field experiment of breeding crop rotation of the breeding and seed production of cereals department of the NSC "Institute of Agriculture of NAAS" in the northern part of the forest-steppe of Ukraine. 140 collectible samples of bread wheat of various ecological and geographical origin were studied in the experiment. Collection samples were manually sown. The area of the site is 1 m2, the placement is systematic. Standards were samples of soft winter wheat Podolianka and Myronivska 808, which were sown through 20 numbers. The accounts were carried out in accordance with the "Methodology of state sort testing". The frost resistance of seedlings was estimated by the method of G.A. Samygin.

During 2011-2016, weather conditions were as follows: 2012, 2014, 2015, unfavourable, 2011 and 2016 are favourable, 2013 - extreme for the growth and development of soft winter wheat.

Results. Collections samples of wheat were grouped by countries and breeding centers of origin. For six years, among the studied varieties of different ecological

and geographical origin, the variation in winter resistance from the highest - 7.11 points (originator of the Bilotserkivska DSS) to the average - 4.75 points in samples of Wx-wheat has been established. Highest winter resistance (7.00 points) was noted in varieties of breeding of PMR "Tiras", a sample from Iran and Romania. Somewhat lower winter resistance was observed in samples of soft winter wheat NSC "Institute of Agriculture of NAAS" (6.86 points), Myronivsky Wheat Institute named after VM Remesla (6.77 points), Institute of Plant Cultivation named after V. Ya. Yuriev and Canada (6.67 points), Donetsk AAP and Germany (6.50 points). Samples from Russia and the Institute of Plant Physiology and Genetics of the National Academy of Sciences had an average winter resistance of 6.41 points, NNP BOR, IZ PR and Bulgaria 6.17 points, Veselopodolianska DSS 6.10 points, Lugansk IAPV 6.08 points, Stepova agrokorporatsiya Ltd. 6 , 06 points. Samples, the originator of which is Plant Breeding and Genetics Institute – National Center of Seed and Cultivar Investigation, had winter resistance 5.90 points and Poltava DAA - 5.67 points. The average winter resistance was observed on the varieties of Selena (5.33 points) and a sample of soft spring wheat from Australia (4.27 points) that was sown before the winter. The varieties of soft winter wheat, the degree of plant development, as well as the state of plants to a large extent determine its resistance to low temperatures. For six years the index of winter resistance was higher in samples of breeding of the Bilotserkivska DSS, however, the extreme weather conditions of 2013 made their adjustments on this characteristics.

According to the results of the observations, it was found that in winter 2013 (sowing of September 27, the appearance of stairs - October 5), winter resistance of the collections samples of wheat varied from the highest (varieties from the NPO "Bor") to the complete destruction of the plants (0 points) - in the variety of Selena Ltd, varieties of foreign origin (Germany, Bulgaria, Australia) and samples of Wx-wheat. Extreme factors (cool weather and excessive humidity in the autumn, hard winter with excessive snowfall on unfreeze soil, exhaustion, freezing and sprouting of plants, snow molds) led to a significant loss of plants in the spring. The average number of plants in the autumn was 207.21 pcs. / M2, in the spring - 62.51 pcs.

The best samples of this year, resistant to snow mold, were specimens of wheat of Myronivsky Wheat Institute named after VM Remesla - Myronivska 808 (8 points, 98.50%), Demetra (8 points, 90.80%), Kolos Myronivsky (9 points, 86.50%), Kalynova (8 points, 82.30%), Kryzhynka (7 points, 76.9%), Myronivska 65 (7 points, 75.8%), Economca (7 points, 73.3%); of breeding of the Bilotserkivska DSS - Olesya (7 points, 83.8%) Perlyna Lisostepu (7 points, 77.1%); NPO "Bor" - Titona (7 points, 85.2%); NSC "IZ NAAN" - Kopylivchanka (7 points, 78.1%), Analogue (7 points, 72.9%), Kesarija Polisska (7 points, 70.3%), Romanivna (8 points, 85.7%) ,

Symphonia (8 points, 81.2%); IP n. after V. Ya. Yuriev NAAN - Alliance (8 points, 78.2%), Perfect (8 (8 points, 74.5%).

The frost resistance of sprouts of winter wheat collections samples was determined in the refrigerating chamber. At a temperature of - 14 ºC the frost resistance of winter wheat samples varied from 15.8 ± 3.7 to 83.2 ± 3.8%. Accordingly, at temperature -16 ºC, the frost resistance of samples was from 2.1 ± 1.4 to 66.3 ± 4.8%. Standard Podolanka had the value of frost resistance of sprouts in the range of 5.3 ± 2.3 and 2.1 ± 1.4%. The frost resistance of winter-resistant variety Myronivska 808 varied from 73.7 ± 4.4 to 84.2 ± 2.8%. Among the samples of wheat of breeding NSC "IZ NAAS" the best frost resistance of sprouts were thus samples as Copylivchanka, Benefis and Polisska 90.

Conclusions. It has been established that for six years of research in collections samples winter resistance varied from 4 to 9 points, and in extreme 2013 - from total plant death to 9 points. In the conditions of the Northern Forest-Steppe in the extreme 2013 (especially for resistance to snow mold), better were collections samples of breeding of the Myronivsky Wheat Institute named after VM Remesla - Myronivs'ka 808, Demetra, Kolos Myronivsky, Kalynova, Kryzynka, Myronivska 65, Economka; Bilotserkivska DSS - Olesya, Perlyna Lisostepu; NPO Bor - Titona; NSC "IZ NAAS" - Kopylivchanka, Analog, Kesarija Polisska, Romanivna, Symphony; IP them V. Ya. Yuriev - Alliance, Perfect.

The best frost resistance of sprouts had samples Copylivchanka, Benefis and Polisska 90 (NSC "IZ NAAS").

***Key words**: soft winter wheat, winter hardiness, frost resistance, snow mold, extreme conditions, sprouts.*