СЕКЦІЯ 2.

АКТУАЛЬНІ ПИТАННЯ ГЕНЕТИКИ І СЕЛЕКЦІЇ СІЛЬСЬКОГОСПОДАРСЬКИХ КУЛЬТУР

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PECULIARITIES OF PRODUCTIVITY AND GRAIN QUALITY FORMATION IN WINTER WHEAT

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Winter wheat (Triticum aestivum L.) is a critically important grain crop, with annual production that significantly affects global food security. Its cultivation covers large areas, and it is the main source of calories and proteins for millions of people around the world. Due to its high adaptability to different climatic conditions, winter wheat is one of the main crops that ensure the stability of food supplies in many countries.

The aim was to assess the features of grain productivity and quality formation depending on varietal and environmental variability.

In the conditions of the research field of the Scientific and Educational Center for Practical Training of the Dnipro State Agrarian and Economic University, the following varieties were evaluated: LNZ PROTEKT, LNZ STAND, LNZ GOLDEN FIELD, LNZ QUALITY, LNZ LIGHT, Dnistryanka Odeska, MIP Darunok, MIP Vidznaka Epitet, Epos, ZU Willem, Atribut, ZU Shamal, Dzhubilo, Janis. The experimental plots were placed in a regular manner with a sowing scheme in triplicate, an area of 10 m^2 each, the standard was sown once per experiment. The sowing rate varied depending on the determined TGW parameter. Structural analysis was carried out by measuring and threshing 25-30 well-developed plants, determining such parameters as the percentage of grain in the total productivity, plant height, weight and number of grains from the main spike, grain weight from the plant, mass of a thousand grains (hereinafter referred to as TGW). Protein content was determined on the Spectran-119R device (for protein and gluten content, 10 g sample). The repetition was threefold. The processing was carried out by factor analysis and cluster analysis. The packages “basic statistics” and “multifactor analysis methods” of the Statistic 10.0 program were used.

The yield of this set of genotypes of different origins was evaluated in 2021-2023. The economic suitability was assessed based on the advantages of this trait in the varieties LNZ PROTEKT, LNZ STAND, LNZ GOLDEN FIELD, LNZ QUALITY, LNZ LIGHT, Dnistryanka

Odeska, MIP Darunok, MIP Vidznaka Epitete, Epos (Ukraine), ZU Willem, Attribute, ZU Shamal (Germany), Jubilo, Janis (France).

The yield parameter depended on both the realization of the variety's potential and the year of cultivation.

According to the results of the study, the varieties Attribute were more suitable in terms of high yield, then Epitete, Epos, Jubilo, Janis, MIP Darunok, MIP Vidznaka. The year 2022 was more contrasting for the trait, 2021 and 2023 differed sharply from each other, but they are characterized by a lower differentiating ability for this set of varieties.

For grouping by yield and classification of varieties depending on variability in weather conditions by year, a cluster analysis was conducted. The first group includes the varieties Epithet, Epos, Jubilo, Janis, MIP Darunok, MIP Vidznaka, ZU Shamal, which generally demonstrate stable high yields for the region. The second group includes the varieties LNZ PROTEKT, LNZ STEND, LNZ GOLDEN FIELD, LNZ QUALITY, LNZ LIGHT, which are significantly inferior to the Pesh, especially in the languages of 2021. The third minor group includes the variety Dnistryanka Odeska, which every year, except 2023, significantly differed in a worse degree from all other varieties. The fourth group includes the Attribute variety, which occupies a leading position in relation to all others each year and according to the results of the test.

Thus, it is worth highlighting varieties such as Attribute, Epithet, Epos, Jubilo, Janis, MIP Darunok, MIP Vidznaka, ZU Shamal in terms of yield, but the first one is certainly an absolute stable leader in the manifestation of high yield.

To establish the mechanisms for obtaining higher yields, a structural analysis of the main components of this trait was conducted according to the following characteristics: the number and weight of grain from the main spike, the weight of grain from the plant, the weight of a thousand grains (hereinafter referred to as TGW).

The indicator of the number of grains from the main spike is very variable and cannot be used to predict higher yields in this case.

The indicator of the weight of grain from the plant was more significant for exceeding the yield, identified as the best variety Attribute.

The grain weight indicator per plant was significant for exceeding the yield, which allows us to conclude that for these varieties the formation of a larger number of well-grained spikelets, as well as the main spike, is important. The next indicator TGW clearly exceeded the standard in most high-yielding varieties, which indicates the significant role of this characteristic in the formation of the crop. Thus, mixed yield formation is observed in more productive varieties.

Grain quality analysis was carried out according to the following characteristics: protein content in the grain, gluten content in the grain, the presence of high- and low-molecular glutenins in the proteins and the total content of gliadins.

Strong wheats include the varieties LNZ PROTEKT, LNZ STEND, LNZ KVALITI, MIP Darunok, MIP Vidznaka, Epitet, Epos, ZU Willem, Atribut, ZU Shamal, Dzhubilo. Varieties Attribute, Epithet, Epos, Dzhubilo, MIP Darunok, MIP Vidznaka, ZU Shamal have high productivity and good quality. While the Janice variety is generally high-yielding, but forms a lower quality. The ZU Willem variety can be used as a high-quality donor. By combining high yields and sufficient quality parameters, it is possible to grow the varieties Attribute, Epithet, Epos, Dzhubilo, MIP Darunok, MIP Vidznaka, ZU Shamal.

The theses material is written on the basis of the authors' research.