

рівень щільності популяції домінантного виду, а показник b – конкуренцію між видами. Статистичний аналіз свідчить, що виявлені зв'язки для всіх вибірок є достовірними ($R^2 = 0,95-0,99$), причому зв'язок є найтіснішим на ділянках вибіркової та суцільної рубки.

Показник конкуренції виявився найбільшим у заповідній зоні ($b=3,17$), меншим на ділянках регульованої ($b=2,71$) та стаціонарної рекреації ($b=2,30$), а найменшим – на ділянках вибіркової ($b=2,16$) та суцільної ($b=2,09$) рубки.

UDC 633.11:631.95:575.22

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**WINTER WHEAT VARIETIES VARIABILITY UNDER
NORTH STEPPE CONDITIONS**

The objectives of our investigations are to describe the phenotypic variation of the main groups by origin (Ukraine, European Union, Russian Federation, Caucasus region) of modern winter wheat varieties regarding their interactions with environmental conditions by agronomic-value traits like as grain productivity, components of one, general protein and gluten content. The most target objects are developing relations between once (correlation relations), which determining wheat quality and yield in a complex. Second our purpose to estimate asset of winter wheat accessions and appear a useful diversity in comparison of modern varieties. To appreciate the interest of researches in the vast geographical representation of wheat varieties, we compared the diversity of several directions of winter wheat breeding in Ukraine from difference regions of the country with great discrepancy in natural conditions and selection purposes in breeding process. All varieties in our investigation were harvested in a location suited to growing wheat, recommended to North Steppe district as suitable for agriculture in this region. Main agronomic-value traits were determined and analyzed.

Experiments were conducted at the experimental fields of Dnipro State Agrarian and Economic University. Weather conditions for hydrothermal indicators in the years of research (2017–2020) varied, which made possible

to obtain objective results, but in general, they were typical. Sowing plots of winter wheat varieties were placed according to a randomized scheme with a plot area of 5 m² in 3 repetitions, and the seeding rate depended on the weight of a thousand grains. Yield assessment was performed by continuous threshing, yield structure was determined by standard parameters in triplicate, the sample was 25–30 plants including the marginal effects (plant height, parameters of the main ear, plant yield, thousand grains weight (TGW)). During the growing season, phenological observations were made, germination and survival after the winter period were determined, crop conditions were visually evaluated, phases of tube yield, earing, and main maturity phases were determined.

We evaluated one varieties of national breeding – Podolianka (national standard), 30 varieties from different ecogeographical zones (obtained from the collection of DSAEU): Podolyanka, st., Pishna, Korowaina, Prydniprovskya, Perlina Polissya, Gospodarka, Sotnitsya, Argument, Kesariya Podilska, Vodogray Bilotserkivsky, Gratsiya Bilotserkivska, Kozir, Klad, Sich, Kubok, Vozzhvinenka (ukrainian breeding varieties), Veba, Morozko, Tabor, Vyd, Adel, Donera, Donna, Viktoriya 11 (Russian Federation), Bodycek, Azano, Daria, Balitus, Albertus, Etana (EU countries), Sefeg-2 (Azerbaijan).

Wheat samples were held at room condition at 18–20 for several days before grinding. Each sample of 30 g weigh was separately ground on a laboratory cyclone grinder (LMT-1, PLAUN LLC, Russia). The protein content were identified on device Spectran RT. Mathematical processing of the results was performed by the method of analysis of variance, the variability of the mean difference was evaluated by Student's t-test, cluster and correlation analyses was conducted by module of multivariate statistic. In all cases, standard tools of the program Statistica 8.0 were used.

Summarized dates of grain productivity next varieties have been identified as more perspective by productive traits in complex Spivanka, Garantiya (Steppe ecotype, breeding special for Steppe conditions), Spasivka, Gileya, Mudrist (Forrest-Steppe ecotype). Differences of ecotypes are characterized by plant architecture and terms of several stages (date of critical stages like, as evidence of spike are earlier than for other types and more suitable for higher quantity of water). We cannot see valuable forms by so key for yield characteristics as number of productive culms and grain weight from m².

After cluster analyse we can subdivided all varieties on three type: 1 cluster for forms which productivity on a level of standard with stable

meaning (Spivanka, Kolyadka, Mudrist, Selevita), 2 cluster for forms with grain productivity significantly lower than Podolyanka (and cluster 1 at general), but with possibility in some years be on this level (Voloshkova, Novosmuglyanka, Komerciyna, Ednist, Spasivka, Bogdana, Garantiya, Zluka, Gileya, Svitanok), 3 cluster for forms with grain productivity significantly lower than Podolyanka (and cluster 1 at general) under any year's conditions. As we can see, this classification cannot dependent from coefficient of yield efficiency and this parameter isn't important for ecological estimation.

Regarding to the cluster classification we can recommended first cluster for Northern Steppe conditions and, partly, second cluster for some years or fore farmers, which placed under river's valley conditions, more humidly.

By gluten content varieties Smuglyanka, Garantiya, Mudrist, Svitanok can be determined due to content higher than standard. Only in one point (variety Smuglyanka) its distinguish from protein content parameter.

In spite of grain productivity by protein content as key agronomic-value trait we can identify some more perspective than standard winter wheat varieties' like as Garantiya, Gileya, Mudrist, Svitanok. Only one of these varieties was corresponded to Steppe ecotype (Garantiya), other three for Forrest-Steppe, which characterized by higher protein content than the grains of first ecotype.

In complex (by quantity and quality traits) we can recommend variety Mudrist as full suitable by all parameters for Northern Steppe subzone (for our Dnipro region), other varieties are suitable only by yield or quality parameters, but variety Spivanka is also suitable on the level of standard by agronomic-value traits complex.

We are thankful to the Czech Development Cooperation support and to the Czech University of Life Sciences, which allowed this scientific cooperation to start for this project.