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Implementation of potential of productivity of structural elements of productivity of winter barley

Goal. To study the patterns of formation of winter barley harvest for the components of the productivity of the ear. Methods. Laboratory, method of dispersion analysis. Results The productivity of separate elements of the structure of barley harvesting of winter brewing use under the influence of technological factors is investigated. The dependence of the number of grains and the mass of grains of the colossus on mineral fertilizers and seeds sowing norms was proved. Conclusions The ambiguous influence of technology factors on the implementation of the productivity potential of winter barley yields is established. On average, in the experiment, dynamic changes in the number of grains in the ear, depending on the seed rate of 300, 350, 400, 450 n./m2 were 24.9; 24.3; 23.5; 22.5 pc., Grains weight - 53.4 mg; 52.7; 51.8; 50.9 mg, respectively.

Key words: winter barley, yield, grain, number of grains in the ear, grains mass, mineral fertilizers, seed sowing rates.

Scientific literature has various interpretations of experimental data on the implementation of the potential of grain yields by the parameters of the number of grains in the ear and grains mass. In particular, MS Savitsky repeatedly indicated that the weight of 1000 grains decreases with the thickening of spring wheat crops [9]. However, there is scientific evidence that, for a much higher seeding rate in spring wheat, the weight of 1000 grains was significantly higher. In other publications of the last century there are facts which have long-standing assertions that, the more in the 1st plant of productive ears, the higher the average weight of grain per 1 colon [4 - 6, 10].

In addition, literary sources confirm that the use of mineral fertilizers contributes to better planting of plants. By such crop formation, the potential of the elements of the productivity of the ear can be improved by the number of grains in the ear and the grain weight [1, 3]. Currently, it is often noted that in the period of intensification of agriculture, the development of crop production is determined by its biologization. Main attention will focus on the main factors of plant growing - plants.

Therefore, the research areas of the crop formation processes, which represent qualitatively new plant management systems, are of great importance and promising.

The purpose of the research is to carry out a research on the direction of plant management in order to establish the regularities of the formation of the winter barley harvest on the composite elements of the ear product.

Materials and methods of research. The research was carried out on the research field of the branch of the Selection, Seedling and Forage Biology Department of the Podillya State Agrarian and Technical University of Obolon Agro, Chemerovetsky District of Khmelnytskyi Region during 2009-2012. Factors: Mineral fertilizers - N30P30K30, N60P60K60, N90P90K90, N160P60K60 , N0P0K0 - control; Standards for seed production - 300, 350, 400, 450 pcs. / m2. Field research has been carried out in accordance with the requirements of scientific agronomy outlined B.A. Vospehovy [2]. The statistics of the parameters of the ears productivity were determined on the basis of the biometric analysis of the large-scale snap material. The density of the productive stem borer was counted in natural conditions in a renamedly selected area of 1 m2 in 4 replicates.

Seed is conducted keeping the depth of seeding ≈ 3 cm and the uniform distribution along the line. Phosphorus-potassium fertilizers were placed under the main course of the soil. One part of the nitrogen

fertilizers (50% of the application rate) was introduced into the pre-seeding soil, the second - before the restoration of the spring vegetation of the plants. The object of the research was a 2-row variety of barley menu of Winter Vintmalt.

Research results. Nowadays, in relation to the cultivation of winter barley, the possibility of using in practice the laws of influence of factors of a technological nature is considered. These issues were of particular relevance with the introduction into the production of winter wheat barley. The solution to this problem was only possible due to the creation of new varieties by breeders by the nature of the morphological structure of the ear, in particular, the 2-row placement of grains. Two-row barley is characterized by high homogeneity of grain weight indices, which is an important characteristic of barley breweries.

Creating 2-row new varieties of barley winter gives the opportunity to provide technology factors for the process of managing the parameters of the ear of corn on the constituent elements. This actually ensures the achievement of the quality of the malt properties of beer barley, related to the grain weight and its homogeneity.

It has been proved that during high agrofine yields the grain yield of winter barley did not directly depend on the experimental parameters from the number of productive shoots per unit area of sowing, which were set by the norm of seeding. An exception is an option without fertilizing (table).

(table) Yield of grain of barley of winter depending on the influence of norms of mineral fertilizer application and seed sowing rates (average for 2010-2012), t / ha

The study of the processes of forming the crop for the composite elements made it possible to determine the dependence of the parameters of the amount of green in the ear and the mass of barley grains at the same level of grain yield from the number of productive stems per unit area of sowing (Fig. 1). It was established that an increase in the number of productive shoots per 1 m2 for increasing the seed seed rate on mineral backgrounds is accompanied by a significant decrease in the grain yield potential of the colon by the number of grains and by the parameters of the mass of the 1st grains. Correlation dependence of these elements of productivity on the density of barley steeblast is strong - r - 0,99. Forecasting according to the established regression equation confirms that an increase in the number of productive shoots by 100 pcs / m2 will result in a decrease in the number of grains in the ear on average by 2.5 pcs. A similar pattern is observed in the change in the mass of grains of barley. Correlation dependence of grains weight on the number of productive shoots given by the seeding rate is very strong - r - 0.99. With the increase in the number of productive shoots by 100 pcs / m2, the prediction of the regression equation will reduce the grain weight by 2.6 mg. The coefficients of the regression equations are reliable (Ff> Fetor) for the highest probability of the coupling regularities p = 0.00. The distribution of the residues is normal, the deviation of the theoretical data from the empirical ones is within the limits of permissible differences.

Fig. 1. Dependence of the number of grains and the mass of grain grains on the number of productive stems under the action of the factor of the norm of seeding: - the number of grains in the ear (Kzk), pcs. (empirical meanings); - quantity of grains in ear, pcs. (theoretical values); - weight of grains of the ear (Mzk), mg (empirical values); - mass of grains of the ear (Mzk), mg (theoretical values)

Analysis of the dependence of grains weight and the number of grains in the ear from the number of productive stems per unit area of sown with the use of mineral fertilizers confirms a similar pattern (Fig. 2). The discrepancy between these processes of the formation of wages lies in the fact that this is due to the growing yield of grain. The implementation of the structural components of yield is characterized by their decrease with an increase in the number of productive stems per 1 m2 of biological capacity of the ear of the grain size and grains mass.

The statistical analysis of the data also confirms the strong correlation dependence of the parameters of the components of the productivity of the ear on the density of barley stem borer formed under the influence of the standards of the mined fertilizers. In the form of the established regression equation, the dependence is straightforward. The reliability of the functional coefficients of the equation is high, the level of significance of the error is very low, the deviation of the theoretical data from the empirical within the permissible values. The maximum values of deviations are for the parameters of the indicator of the number of grains 0,05, grains mass - 0,07. According to the forecast, with the use of fertilizers, an increase in the number of shoots

by 100 pcs / m2 leads to a decrease in the number of grains in the ear for 0.6 pc., The weight of the 1st grains - 0.8 mg.

Fig. 2. Dependence of the number of grains and the mass of grain of the ear on the number of productive stems for the application of mineral fertilizers: - the number of grains in the ear, pc. (empirical values); - quantity of grains in ear, pcs. (theoretical values); - mass of grains of the ear, mg (empirical values); - mass of grains of colossus, mg (theoretical values)

The generalization of the obtained results gives grounds to formulate the basic principles of the constitutionality of the mutual compensation of the levels of grain yield elements. Increasing or decreasing the density of productive stalkstone by the number of stems per unit sown area of the barley menu of the winter leads to a decrease or increase in the implementation of the biological potential of the colon's productivity by the number of grains and grain weight. Intercompensation of the elements of productivity with the increase in the number of productive shoots per 1 m2 at the expense of the higher seed seed rate occurs at a uniform, unchanged level of grain yield, which is an important feature of the effect of the seed seed rates. Intercompensation of the parameters of the yield structure with the use of mineral fertilizers occurs at similar constants. However, for the gradual increase in the number of productive stems per unit area of sowing, there is a decline in the implementation of the biological potential of winter barley by the number of grains in the ear and grains mass at regular growing grain yields.

It should be noted that there are significant differences in the forecasting data, which are indicated above, - by the number of grains, depending on the seed rate and application of fertilizers, they make up 2.5 and 0.6 pcs. on the ear respectively. For the mass of grains, similar to the sequence of these factors, the prediction data will be 2.6 and 0.8 mg, the difference is obvious. In addition, this gives grounds for a comparative analysis of empirical data based on the results of the theoretical substantiation of the dynamics of changes in the elements of the yield structure, depending on the influence of the two factors included in the experiment. It is found that at 600 productive shoots, obtained from seed rates seeds, the number of grains in the ear is 23.2 pcs., the grain weight is 51.6 mg. Using mineral fertilizers for the same parameters, the number of productive stems per unit area of sowing, similar elements of yield correspond to 23.9 pcs. grains in the ear and grains mass of 52.3 mg. This confirms that the formation of separate elements of yield, depending on the investigated factors, takes place differently, that is ambiguously, and at a much higher level of grain yield for fertilization, it is at the expense of higher productivity of the ear.

According to these laws, it is possible to explain the effectiveness of using mineral fertilizers precisely in relation to the influence of the factor of seed seed rate. It is necessary to draw attention to the data of literary sources, which noted the important role of phosphorus and potassium in the development of the root system of grain crops, in particular, in strengthening the branching of the root system in plants. It is also noted that in the barley, due to lack of potassium, the root tissues die off with the onset of milk in the ripeness of milk [11].

It is worth noting that in barley growth of grains and pouring occur simultaneously [7]. If grain growth is somewhat restrained, its storage capacity for dry matter decreases accordingly [8]. This can be explained by the decrease in the realization of the grain yield potential of barley by its weight at the same density of stem borer, but on the lower background of mineral nutrition.

Conclusions

According to the results of the research, the ambiguous influence of the technology factors on the implementation of the productivity potential of the elements of winter barley yield was established. The dependence of the productivity of barley corn on seed sowing norms and application of mineral fertilizers is proved.

On average, in the experiment, dynamic changes in the number of grains in the ear, depending on the seed rate of 300, 350, 400, 450 n./m2, make up 24.9; 24.3; 23.5; 22.5 pcs., Grain weight - 53.4; 52.7; 51.8; 50.9 mg, respectively.

Under the influence of mineral fertilizers N30P30K30, N60P60K60, N90P90K90, N120P120K120 according to the norms of application, similar elements of the structure of yields are 24.8; 24.1; 23.4; 22.8 pc grains in ear and 53,4; 52.6; 51.7; 51.1 mg.

The research has established that with an increase in the number of productive stems by 100 pcs / m2 due to the seed seed rate, there was a decrease in the grains mass by 2.6 mg, with fertilizers only 0.8 mg, the number of grains - respectively 2.5 and 0.6 pc. per spike

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