THE EVALUATION OF THE PRODUCTION OF "KUIALNIK" AUTUMN COMMON WHEAT VARIETY IN POLYFACTORIAL EXPERIENCES

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Abstract

During the experiments on the productive potential of the variety „Kuialnik" under the action of three technological factors with different graduations it has been proved its membership in the group of plastic varieties. The obtained yield and grain quality indicated to the priority of the forerunner peas due to the nitrogen fixing bacteria which is favorable for the plant growth. The forerunner spring vetch is less productive, since a part of the biological nitrogen is used by the oat plants. An increased yield was obtained from the variants having the density of 6 million germinating seeds per hectare, which were sowed in the recommended period after the forerunner peas and constituted - 4441.6 kg/ha. The yield of Kuialnik variety was higher after the forerunner peas - 4151.1 kg/ha compared with the forerunner spring vetch - 3706.4 kg/ha. The yield difference after the studied forerunners is 444.7 kg/ha on behalf of the peas. The yield growth is provided statistically by a significantly positive record $DL_{05}B$=68 kg/ha. After the forerunner peas, the highest yield was obtained in the second sowing (22.X) - 5022,4 kg/ha, which had significantly exceeded the recommended period (27.IX) and in the late sowing period (12.XI) with 585.3 and 1442.7 kg/ha. After the forerunner spring vetch, the recommended sowing period ensured the maximum yield - 4215.3 kg/ha, significantly exceeding the allowed period (456.0 kg/ha) and the late period (1071.3 kg/ha). The yield of Kuialnik variety in different variants of the sowing density was at the same level as in the control variant (5.0 million - 3928.3 kg/ha). Creating a hierarchy of the technological factors that induce fluctuations in the protein content of wheat grains it results that its values classifies the variety Kuialnik in the quality group B, meaning that it is good for baking. The protein content was higher in the grains of wheat grown after the forerunner spring vetch - 13.75%, or by 0.09% more than in the control group after the forerunner peas, the difference being statistically recorded as negative - DL being of 0,88 %.

Key words: *Triticum aestivum*, density, forerunner, proteins, yield

For obtaining a qualitative, stable and in creased production it is particularly important to select a wheat variety with a raised capacity of production that should ensure the best concordance between pedoclimatic and biological peculiarities of the variety. The level of the obtained productions depends on optimum application of all technological elements in wheat cultivation among which are the forerunner epoch and sowing density. Starting with the above considerations we proposed ourselves that by our researches scientifically to motivate the contribution of the terms and sowing density to the level of grains production of „Kuialnik„ autumn common wheat variety.

MATERIAL AND METHOD

The method of the experience setting is systematically in 4 repetitions (3 repetitions for production determination and the 4 threpetition is destined to observations and measurements).

The surface of the parcel is 50 m^2 . During the vegetation period they were made phonological observations and biometrical measurements according with the experimental technics concerning the number of the ears / m^2, height of the plants, number of the grains in the spike, mass of the grains / ear etc. The statistic interpretation of the obtained results was made by the method of dispersal analysis.

The factors taken in the study:

Factor- A - forerunners with graduations:
Pea for peas (Mt);
Spring vetch;
Factor- B - sowing period, with graduations:
September 27 (Mt);
October 22 (admissible);
November 12 (belated);
Factor- C - density of sowing, with graduations:
4 mln. of viable seeds per ha;
5 mln. of viable seeds per ha (Mt);
6 mln. viable seeds per ha;

The biological material - „Kuialnik„ variety was created at the Institute of Selection and Genetics of A.S.A of Ukraine. *Erhytrospermum* - variety. It is a super - intensive variety pretentious to the cultivation conditions, disposes of high productivity. The vegetation period is of 273 - 281 days. The hibernation resistance at the level of the middle indicators for the steppe zone. It is resistant at the fungi diseases of stems and leaves. The plants

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belong to the group with middle size, it is aristae. The spike is fuse form, dense, of white color.

The grains quality. The variety belongs to the group of strong varieties, belongs to the ,,A,, class. The power of the flour is 460 - 510 u.a., the volume of a baking bread from 100 gr. flour - 1400 cm^3, the total evaluation of the bread - 5 points, the content of the protein is 13.0 - 13.7 efficiency of the flour is 76%, content of gluten is of 27.5 - 28,7%. It is recommended to cultivate it after good forerunners; it reacts positively to the nitrogen fertilizers. The aristae of middle length do not surpass the length of the ear. The grain of red color, the mass of 1000 spikes is of 40 - 42 gr. The leaves are not pubescent, of green color. It is resistant at the drought. The resistance at the brown rust constitutes 4 points, at the*podosperaleucotrica* 5 points.

Table 1

The production of ,,Kuialnik,, autumn common wheat variety, kg/ha, 2013

Sowing density mln/ha-factor ,,C,,	Forerunner plant – the factor ,, A,,						Average on the factor ,,C,, DI_{05} ,kg=83.0	+ -
	Pea for peas (Mt)			*Avenasativa+Vicia sativa*				
	Sowing period – Factor ,, B,,							
	27.09.12(Mt)	22.10.12	12.11.12	27.09.12(Mt)	22.11.12	12.11.12		
4	4461.6	5059.0	2916.6	4343.6	3676.0	2892.0	3891.4	-36.9
5(Mt)	4408.3	4900.0	2991,6	4072.0	3910.0	3288.0	3928.3	-
60	4441.6	5108.3	3075.0	4231.0	3693.3	3252.0	3966.8	+38.5
Average on the factor ,,A,,	4151.1			3706,4				
DI_{05} A,kg=67.8	-444,7							
Average on the factor ,,B,,	4437.1	5022.4	2994.4	4215.3	3759.7	3144.0		
DI_{05} B , kg = 83.0	-	+585.3	-1442.7	-	-456.0	-1071.3		
DI_{05} of experience, kg =	203,3							

Table 2

The content of protein substances in the grains of Kuialnik autumn wheat variety in the factorial experiences, %, 2013

Density of sowing, mln / ha – factor "C"	Upcoming plant – Factor "A"						Average on "C" Factor DI_{05}, kg= 1.17	In comparison with control
	Pea for peas (Mt)			*Avenasativa+Vicia sativa*				
	Sowing period – Factor "B"							
	27.09.12(Mt)	22.10.12	12.11.12	27.09.12(Mt)	22.11.12	12.11.12		
4	12.71	13.86	13.28	12.82	13.73	14.17	13.43	- 0.08
5 (Mt)	12.36	13.70	13.61	13.03	13.86	14.72	13.55	-
6	13.10	13.56	13.72	12.64	13.88	14.94	13.64	+0.09
Average on factor "A"	13.32			13.75				
DI_{05} A, kg = 0.88%	+0.43							
Average on factor "B"	12.72	13.71	13.54	12.83	13.82	14.61		
DI_{05} B, kg = 1.17%	-	+0.99	+0.82	-	+0.99	+0.79		
$DI_{05}$of general experience, %	2,85							

RESULTS AND DISCUSSIONS

The principal indicators reflecting the effective variant of the experience is the production that in a large measure depends on climatic conditions and quality of applied technological elements. Experiencing the productive potential of the **„Kuialnik„** variety under the action of three technological factors with diverse graduations it was confirmed the appartenance to the group plastic varieties. The evidence of the production and quality of caryopses indicate the priority of the pea for peas forerunner due to fixing nitrogen bacteria in favorable conditions for plants growing and developing. The spring vetch forerunner is less ensured as a part of biological nitrogen is utilized by the oats. It was obtained an increase of production at the variants with the density of 6 mln., of germinable seeds per ha., being sowed in the recommended period after the forerunner pea for peas that had constituted – 4441.6 kg/ha.. The production **„ Kuialnik „** variety was bigger after the forerunner pea for peas – 4151.1 kg/ha., in comparison with spring vetch – 3706.4 kg/ha. The difference in production is statistically ensured, significantly positive DI_{05} B = 67,8 kg/ha . After the forerunner pea for peas the biggest production was obtained the second (22.X.) - 5022.4 kg/ha, that significantly surpassed the recommendable (27.IX.) and belated (12.XI.) with 585.3 and 1442.7 kg/ha. After forerunner spring vetch the term of recommended sowing ensured a maximum production – 4215.3 kg/ha, surpassing significantly the admissible term (456.0 kg/ha and belated (1071.3 kg/ha).The production of **„Kuialnik„** variety at the variants with different density of sowing was at the

level of the control (5 mln. -3928.3 kg/ha.).

In the polyfactorial experience influenced more essentially at the level of production of **Select** variety the factor - B- the sowing period 64.89%, the influence quota of the forerunner constituted 34.32% = factor „C„ the density of sowing – 0.45%. The double interaction of the factors „AC„ - 0.23%.

The triple interaction 0 %.

Hierarchizing the technological factors that induce fluctuations of the wheat caryopses in the protein results that the values of this one at **Kuialnik** variety are being joined in the qualitative class B good for turning into bread. The protein content was more superior in the grains of the wheat grown after spring vetch forerunner – 13.73% or with 0.09% more than after the control – pea for peas with ensured difference statistically, significantly negative, DL being of 0.88%.

Also the surplus of protein obtained in the more belated terms without control, is with a difference ensured statistically, significantly negative, DL being of 1.17%. The same situation is being also observed at the variants with diverse graduations of the sowing density. The variability of the protein content of the wheat caryopses is influenced by the year of cultivation especially by the state of fertility of the soil, concerning the quantity and availability of the mineral nitrogen and climatic conditions especially in the period of harvesting.

CONCLUSIONS

From the analysis of the obtained data we can conclude that the "Kuialnik" autumn common wheat variety provides qualitative increased productions after forerunner pea for peas sowed in admissible period with the density of 6mln. Of viable seeds per hectare and after spring veth at the same density in the recommended epoch.

REFERENCES

Boincean B.P. et al., 2013 - *Alternative technologies of autumn wheat cultivation in Republic of Moldova* (guide – book). Chisinau.p. 47.

Starodub V., 2005 - *Establishment of the sowing optimum epoch of the autumn common wheat in the central zone of Moldova.* Agricultural Sciense", Chisinau, nr. 1, p. 6-10.

Starodub V., Gheorghiev N., Paladi N., 2006 - *Production of autumn cereals in crop rotation asolament with saturation of vegetables*., "Agricultural Science", Chisinau, nr.2, p. 10-13.