ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 7| Issue: 12| December 2021|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2021: 8.047 || ISI Value: 1.188

UDC: 633.11.631.175.658

TECHNOLOGICAL INDICATORS OF GRAIN QUALITY OF WINTER WHEAT VARIETIES WHEN APPLYING MINERAL FERTILIZERS AT DIFFERENT TIMES

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ANNOTATION

The article provides data on the study of the influence of the timing of the introduction of mineral fertilizers on the technological indicators of soft wheat grain in the arid climate of the Republic of Karakalpakstan. According to the research results, the positive effect of fractional application of nitrogen fertilizers on the improvement of technological parameters of grain in comparison with a one-time, pre-sowing application was noted. The varieties that, under these conditions, formed the best technological indicators corresponding to a high group of grain quality, were noted.

KEY WORDS: ***wheat, variety, agriculture, grain, production, food.***

INTRODUCTION

Wheat grain is one of the main agricultural products. Important food products are produced from grain: flour, cereals, bread and pasta. Grain is necessary for the successful development of animal husbandry and poultry farming, and also serves as a raw material for starch, molasses, alcohol and other products.

Along with increasing grain production, special attention is paid to improving the quality of grain. According to literature data, wheat production consumes about 15% of the total amount of applied mineral fertilizers in the world.

THE RELEVANCE OF RESEARCH

Modern crop varieties are high-yielding and nutrient-rich. It should be noted that the soil conditions in the study area (the Republic of Karakalpakstan) are extremely poor in nutrients, including nitrogen.

It is possible to eliminate the deficiency in nutrients with a low content in the soil thanks to the use of fertilizers. In the USA, an increase in grain yield is provided by 40 ... 50% using mineral and organic fertilizers, and the rest is due to mechanization of production, irrigation, selection and seed production. In China, Pakistan and Russia, periods of growth in yields coincide with periods of growth in the use of mineral fertilizers, which confirms the significant role of sufficient plant nutrition for the growth of stable wheat yields [7; p. 185-198].

The positive effect of nitrogen fertilizers on the yield of cereal crops was noted in the studies of Vignjevic M., Wang X., Olesen J. E., Wollenweber B. [8, p.32-48], Lin R., Chen C. [6; p. 475-485], Z. Braziene [5; p.89-99], Amélie C.M. Gaudin, Ken Janovicek, Bill Deen, David C. Hooker [4; pp. 1-10], it was revealed that the effective use of nitrogen fertilizers is of great importance in increasing the yield.

RESEARCH CONDITIONS AND METHODS

In the conditions of the Nukus region of the Republic of Karakalpakstan, we studied the technological indicators of the quality of winter wheat varieties grown with various methods of applying mineral fertilizers (Table 1). The objects of research were the varieties Polovchanka, Skifyanka, Spartanka and Yuna.

The region's soils are meadow-alluvial, arid, characterized by a low humus content (up to 1%), natural soil drought associated with high summer temperatures. As a result, about 80-90% of the arable lands of the zone are distinguished by varying degrees of salinity, with a predominance of the chloride type [3; P. 32-33].

RESEARCH METHODOLOGY

During the research period, analyzes and observations were carried out according to the following methods: Determination of the grain nature on a liter pork, the vitreousness of the grain was analyzed on a DSZ-3 diaphanoscope, determination of the protein content by the Barnstein method. the gluten content was determined according to GOST 13586.1-68.

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RESEARCH RESULTS AND THEIR DISCUSSION

In the studies of A.I. Erokhin, Z.R. Tsukanova, E.V. Latyntseva [1; p. 129-133], E.V. Zhuravleva [2; p.59-63], foliar feeding of winter wheat with nitrogen fertilizers for vegetative plants had a positive effect on an increase in leaf surface, an increase in the intensity of photosynthesis, which created favorable conditions for the accumulation of dry matter and the formation of a crop with good grain quality. The technological properties of the grain of soft wheat varieties used in baking are characterized by a number of indicators by which their suitability and intended use in grain processing enterprises are assessed. According to the data given earlier, the indicators of grain quality in the lower reaches of the Amu Darya River are not distinguished by high indicators, therefore, all agro-technological methods should be aimed at increasing these indicators. Since the nature is formed depending on the density of the grain, evenness, the content of impurities and the degree of filling of the kernels, which do not have high indicators due to the aridity of the air during the period of filling and ripening of the grain. Grain with a larger nature and good finish, contains more endosperm and fewer shells, which provides a greater yield of flour and cereals, which can be obtained with a good and balanced nitrogen nutrition.

The results of determining the nature of grain showed that the studied varieties have approximately the same indicators, both when applying 100% nitrogen fertilizers for pre-sowing cultivation, and when applying N30 for pre-sowing cultivation + N50 during the period of spring regrowth + N30 in the phase of milk ripeness. More effective is the fractional application of nitrogen fertilizers, which increases the grain size by an average of 57 grams; the greatest grain nature was formed in the Polovchanka and Skifyanka varieties 788 and 792 g / l (Table 1).

To obtain wheat with good technological performance, they must have good grain vitality, which characterizes the consistency, structure of the endosperm, and the interposition of its tissues. In the glassy grain of wheat, the protein content is higher than that of the mealy one.

Table 1

Grain **qualities of winter wheat varieties at different periods of nitrogen fertilization**

Varieties	Grain quality indicators				
	grain nature, g / l	glass visibility,%	protein in grain,%	quantity in adhesive guilt,%	Quality group gluten free by IDK show
100% nitrogen fertilizers for presowing cultivation					
Polovchanka	732	58	13,2	28	I-II
Scythian	728	56	13,0	28	I
Spartan	720	54	12,6	26	I-II
Yuna	724	57	12,6	25	I
N30 for presowing cultivation + N50 in the period of spring regrowth + N30 in the phase of milk ripeness					
Polovchanka	788	64	14,1	32	I
Scythian	792	63	14,7	33	I
Spartan	778	61	13,5	30	I
Yuna	772	62	13,1	34	I

Therefore, in the production of flour from wheat, glassy grain is valued, which gives products of the best presentation. According to our data, the fractional application of nitrogen fertilizers increased the glassiness on average for varieties by 6.5% and varied for varieties from 61 to 64%.

The protein content in the grain changed in proportion to the change in vitreousness, the best quality indicators, according to these characteristics, the varieties Polovchanka and Skifyanka were well distinguished. For example, in the Scythianka variety, the protein content was higher by 0.4-1.6% compared to other varieties.

The amount of protein and gluten in the grain was interrelated: with an increase in the protein content of the grain, the gluten content increased by about 4%. Accordingly, the highest gluten quality was observed in the Polovchanka and Skifyanka varieties, which corresponded to the indicators of group I, and in the Spartanka and Yuna varieties, the gluten quality at pre-sowing application corresponded to the I and II groups.

Thus, the quality of the crop is determined by the ratio and the totality of the action of internal and external factors. External factors are climatic conditions, soil composition and a set of agrotechnical measures. In unfavorable soil and climatic conditions, in order to improve the technological parameters of grain, the effective use of fertilizers is of great importance, which contributes to the expansion of crops with crushing wheat on reclaimed lands.

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CONCLUSIONS

Fractional application of nitrogen fertilizers improves technological indicators of grain quality in comparison with a one-time, pre-sowing application. Among the cultivars studied in the soil and climatic conditions of the experiments, the best technological indicators in comparison with the control (cultivar Polovchanka) were formed by the plants of the cultivar Skifyanka. The protein content in the grain of this variety reached 14.7%, the gluten content - 33% and it met the requirements of the I quality group. Thus, the quality of grain in the studied conditions depends on both internal (variety) and external conditions, in this case, the methods of applying nitrogen fertilizers.

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