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THE DEPENDENCE OF FERTILIZERS AFTEREFFECT ON THE ON THE YIELD OF SPRING BARLEY FROM WEATHER CONDITIONS IN THE RIGHT BANK FOREST-STEPPE

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The actuality of the theme. Productivity of crops is due to several factors that directly and / or indirectly affect the nutrition plants. Among the causes uncontrolled fluctuation in crop yields is climate change. In Ukraine the climate is recently changing by the years, there are significant numbers of adverse conditions in the various stages of organogenesis plants. Harmful influence the growth and development of plants have sudden changes of temperatures during the day. Therefore, the accounting of climate and weather conditions impact on the nature of transformation and efficiency of fertilizers in soil is important for the development of the system fertilization.

The aim of the study is the establish of the system fertilizing aftereffect in grain-beet crop rotation of the Forest-steppe of Ukraine on spring barley yield under the different weather conditions, in years with a different hydrothermal coefficient value.

Results and discussion. Studies were conducted in a stationary experiment of the Agricultural chemistry and quality crop product department, which is located within the Research Station of National University of Life and Environmental Sciences of Ukraine (Kyiv region).

The research included the variants of the aftereffect of the fertilizers saturation to the productivity of spring barley: control (without fertilizer); 12 t/ha of organic fertilizer - background; on the background 81 kg P/ha; 166 kg NP; 239 and 358 kg NPK/ha.

In the experiment was studied the variety of spring barley Sebastian, which is recommended for cultivation in the Polissia and Forest-steppe zones of Ukraine.

Weather conditions distinguished by changeable temperature and atmospheric precipitation on years of the research compared to the average long-term data. This affected the yield of spring barley grown under different aftereffect of fertilization in crop rotation. To determine the effect of certain weather parameters (temperature, humidity and quantity of precipitation) on the yield of spring barley during the growing season was used the average value for 2013-2015 years of research.

The main value that reflects the relationship of weather conditions (temperature – rainfall) is a hydrothermal coefficient (HTC) for a year and growing season.

Values of HTC were calculated for the growing season (April-July) of spring barley. In average the vegetation periods in the years of research were assigned to classes according to the following criterion:

dry (D) $0.71 < HTC < 1.0$;

optimum (O) $1.31 < HTK < 1.60$;

quite wet (QW) $1.61 < HTK < 2.0$.

Therefore, in 2013 the value of hydrothermal coefficient is 1,32 (O), in 2014 - 1,82 (QW), in 2015 - 0,78 (D).

Although 2013 was optimum by the HTC, in the early spring growing season there was drought, the quantity of precipitation was less on 11 mm than average by long-term data. As the result the initial growth of plants was uneven. In 2014 the quantity precipitation during the growing season was 357 mm. Totally the rain has been falling for 96 days during the growing season of barley. This led to the continued of the duration of the first period and the growing season of barley. The 2015 was extremely dry. The rainfall deficit compared to long-term data - 94 mm during the vegetation period - was the reason for the rapid drying of crops and dry matter accumulation in plants. Thus, the weather conditions were different from the long-term data and had an impact on the spring barley productivity.

The productivity of crops is the criterion that quantitatively reflects the impact of weather conditions as well as the nutrition. The aftereffect of the fertilizers saturation in grain-beet rotation creates the conditions for improve growing and development of barley.

The highest yield (4,50-5,14 t/ha) of barley grain was obtained in the variant aftereffect of 358 kg NPK of fertilizer. Although, in 2014 were obtained the higher yields than in 2013 and 2015 the difference between the yields in variants of the fertilizers aftereffect and control (without fertilizers) was lower compared to other years. It may be the result of favorable conditions of humidity and growth of plants more evenly in all variants of the research not only by the fertilizers aftereffect.

The highest increasing of the barley crop compared to control were obtained in 2013 - 0,25-2,60 t/ha depending on the research variant when optimum weather conditions contributed to the effective aftereffect of fertilizers.

The relationships between barley yields and the hydrothermal coefficient of the growing season were examined using correlation analysis. The regression equation demonstrated that the yield was significantly affected by the atmospheric precipitation, i.e. the moisture conditions during April-July mostly influenced on the crop formation. The regression coefficient of the relationship between yield and rainfall determined as R^2 0,99, between yield and air humidity as R^2 0,67, between yield and air temperature as R^2 -0,62. Thus, temperatures on the contrary had a negative impact on the yield of barley. The lowest yield in all variants of research were obtained in 2015 when in April-July ΔT was + 0,2 ^0C and ΔW -104mm.

Conclusions. The yield of crop is caused by various factors, including supply of nutrient elements such factor as exposed management. The highest yields of spring barley (4,50-5,14 t / ha) during the years were obtained by the saturation aftereffect of the 1,5-rates of fertilizers. Among the causes uncontrolled fluctuations of yield are weather conditions. In 2014 the difference of grain yield in variants with aftereffect of the fertilizers and control was lower compared to other years. Correlation coefficient indicates the most significant direct relationship of spring barley yield and rainfall (R^2 = 0,99), i.e. moisture conditions during April-July most positively influenced the formation of the crop. The temperature during the growing season of spring barley had the reverse effect (R^2 = -0,62) to grain yield.