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INFLUENCE FACTORS ON GROWTH AGROECOLOGICAL SPRINGDURUMWHEAT DEPENDING FERTILIZERS ANDBIOLOGICS

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The use of fertilizers and inoculation of wheat seeds solid spring biological products positively affected to the growth and development of plants. Effects of fertilizer on plant height was significantly more than biologics, but their complex influence was more effective in increasing the growth processes in solid spring wheat plants, in this case, apparent negative effect unfavorable growing season. Without the use of fertilizer plant height was 63.6 cm. Usingpolimiksobakterynu increased to 67.2cm, diazofitu - to 68.6 cm.

Keywords: *springdurumwheat, fertilizers, polimiksobakteryn, diazofit, plant height.*

Statement of the problem. In vivo growth and development of plants depends on the range of external factors, such as soil, nutrients, light, moisture, heat, etc.. A favorable combination of these factors increases the growth processes, and for their lack or excess observed weakening of plants. Despite the fact that the study and development of wheat farming has long given considerable attention, but the experimental data on the growth processes of plants of spring wheat in the spring and summer growing season depending on the level of mineral nutrition and biologics and due to significant climate change in the steppes of left-bank Ukraine found very little.

Analysis of major studies and publications which discuss the problem. Favorable conditions for high productivity plants, and to maintain soil fertility at the right level, created with the full support of their batteries [1]. The available plant nutrients are supplied by mineralization of organic compounds by soil microorganisms and transition soluble mineral substances soluble in [2, 3].

High performance and grain quality are achieved optimal ratio above factors at all stages of growth and development of plants. Given the ways that positively or negatively affect productivity, we can significantly reduce the negative impact of weather conditions and purposefully use the technology of cultivation that they can control people [4,5]. In this regard, considerable importance is the use of agro-technical measures aimed at saving the maximum use of soil moisture in the formation yields. An important condition for reducing the coefficient of water plants is to create

optimal mineral nutrition, providing the best plant growth stages in organogenesis and produce high yields. [6]

The use of biological and chemical agents in wheat technology has a positive effect on the growth and development of individual plant organs and the body as a whole. Therefore, a prerequisite for their use is a comprehensive study of the impact on the formation of yield and grain quality [7].

The purpose and objectives of the study. The aim of our research was to study the peculiarities of plant growth and development of springdurumwheat depending on growing conditions, set the application rate of fertilizer if applied biologics that promote optimal development of overground and underground plant parts and ensure the formation of a stable high grain yield regardless of weather conditions.

Research Objectives - To study characteristics of growth and development of plants by pre-sowing seed treatment use of various biological agents depending on the level of mineral nutrition and establish their optimal ratio for the formation of a stable grain yield of spring wheat firm with high quality features.

Materials and methods research. Basic research conducted at the experimental field of Poltava APV Vavilov Institute in 2010-2012. The influence of pre-sowing seed treatment preparations according to the microbiological balance method calculated background mineral nutrition of plants on yield of 3 t/ha of grain. We studied six backgrounds mineral nutrition: without fertilizers - control; N_{45}; $P_{45}K_{30}$; $N_{45}P_{45}K_{30;}$ $N_{23}P_{23}K_{15}$; stubble predecessor +N_{10} per tonne by products. During the growing period spent monitoring the growth and development of plants.

Studies. The use of fertilizers and inoculation of seeds of spring wheat biological products have positively influenced the growth and development of plants (Table 1). In the phase of earing height of wheat plants without the use of fertilizers and inoculation in 2010 was 56.7 cm, for use polimiksobakteryn it increased to 65.8 cm, diazofit - up to 68.9 cm, with their application compatible - up to 63.9 cm. By use of fertilizers in doses $N_{45}P_{45}K_{30}$ plant height increased to 62.5 cm without inoculation. By joint action of fertilizers and biological products, the figure was within 71,7-73,6 cm. By reducing the dose of fertilizer twice ($N_{23}P_{23}K_{15}$) inoculation with plant height was 62.0 cm, for seed treatment microbiopreparation - 66,6-70,5 cm. Results of correlation analysis showed that biologics increased plant height: 15.9% (polimiksobakteryn), 17.0% (diazofit) and 13.2% (combined use of two drugs). As regards fertilizers, the increase in the height of wheat plants was highest for making N45P45K30 - (9.9%). Weather conditions in 2011 led to an increase in the height of wheat plants to 84.0 cm without the use of fertilizers. Seed treatment biological products contributed to the increase in plant height to 86.7 cm for processing polimiksobakteryn to 85.5 cm - diazofit, 86.4 cm - a mixture of drugs. In the background N45P45K30 fertilized plant height increased to 90.2 cm for

further processing diazofit - up to 97.5 cm with a mixture of seed treatment products contributed to the increase in plant height 98.2 cm. All other backgrounds fertilized biological effects on plant height of wheat was slightly lower (within 3-5%).

1. Height of springdurumwheat plants depending on the effect of mineral fertilizers and biological products, cm

Variants of fertilization	without inoculation	polimikso bakteryn	diazofit	mixture (polimiksobakteryn and diazofit)
2010				
Without fertilizer	56,7	65,8	68,9	63,9
$N_{45}P_{45}K_{30}$	62,5	73,6	72,7	71,7
Straw precursor to + N_{10} tonne of by-products	63,0	70,8	67,8	67,3
$N_{23}P_{23}K_{15}$	62,0	66,6	70,5	68,3
N_{45}	58,5	71,9	72,9	70,5
$P_{45}K_{30}$	57,6	68,8	68,8	66,0
2011				
Without fertilizer	84,0	85,5	86,7	86,4
$N_{45}P_{45}K_{30}$	90,2	90,0	97,5	98,2
Straw precursor to + N_{10} tonne of by-products	86,2	86,3	86,5	87,2
$N_{23}P_{23}K_{15}$	89,2	90,6	95,9	99,6
N_{45}	85,3	86,4	88,9	89,0
$P_{45}K_{30}$	84,3	86,1	87,4	87,1
2012				
Without fertilizer	50,0	50,4	50,2	50,1
$N_{45}P_{45}K_{30}$	55,9	56,6	63,0	63,2
Straw precursor to + N_{10} tonne of by-products	55,4	55,8	60,1	61,5
$N_{23}P_{23}K_{15}$	55,9	56,9	60,1	61,5
N_{45}	55,4	56,9	61,1	61,5
$P_{45}K_{30}$	54,4	55,5	55,7	59,3

In 2012 the dry conditions of the growing season led to the formation of dwarf wheat plants, whose height was 50,0-50,4 cm on plots without fertilizer, for making them rose up to 54,4-55,9 cm. The use of biologics in different backgrounds fertilization had a positive effect, which is manifested in a slight increase of height of plants (1,0-3,0%).

According to the three-year study found a positive biological effect on plant height of wheat, besides their different backgrounds adjust the effect of mineral nutrition (Fig. 1).

Without the use of fertilizer plant height was 63.6 cm, using polimiksobakteryn was raised - up to 67.2, azotofit- up to 68.6 cm. Seed treatment before sowing a mixture of two drugs did not

help increase plant height (66.8 cm) compared with their individual use. All other biologics fertilized backgrounds contributed to raising the height of the plants inoculated with 69.5 cm 71,3-77,7 cm to its application ($N_{45}P_{45}K_{30}$), and accordingly, on the other fertilized backgrounds: 68.2 and 71.0 -72.0 (straw predecessor + N_{10} per tonne of by-products), 69,0 i 71,3-76,5 ($N_{23}P_{23}K_{15}$), 66,4 i 71,7-74,3 (N_{45}), 65,4 cm and 70,1-70,8 cm ($P_{45}K_{30}$).

Effect of inoculation of grain (Fig. 2) and different backgrounds mineral nutrition (Fig. 3) shows that the height of the plants separately in each experiment, all options were different. Found that plant height of spring durum wheat under the influence polimiksobakterynu increased by 3.4 cm (5.1%), diazofitu - 6.0 cm (9.0%), and the mixture polimiksobakterynu diazofitu - 5.9 cm (8 8%). Plant height at different backgrounds mineral nutrients increased by 12,6 cm (20,5%) for making N45R45K30, 9.2 cm (15.0%) - in the areas of fertilization "stubble predecessor + N_{10} per tonne of by-products", 11.5 cm (18.7%) - for fertilizer $N_{23}P_{23}K_{15}$, 11.6 cm (18.9%) - for fertilizer N_{45}, 11,7 cm (19.0%) - for fertilizer N_{45}, 7,7 cm (12,5 %) – for fertilizer $P_{45}K_{30}$.

Conclusions:

1. The use of fertilizers and inoculation of seeds of spring wheat biological products positively affected plant growth and development, contributing the optimum plant growth regardless of weather conditions.

2. Without the use of fertilizer plant height was 63.6 cm, for use polimiksobakteryn increased to 67.2, diazofit - up to 68.6 inches. Seed treatment before sowing a mixture of two drugs did not promote an increase in plant height (66.8 cm) compared with their individual use.

3. Effect of fertilizer on plant height was much more significant than a biological effect, but their complex effect was most effective in increasing growth processes in hard spring wheat plants, in addition smoothed negative effect unfavorable growing season.

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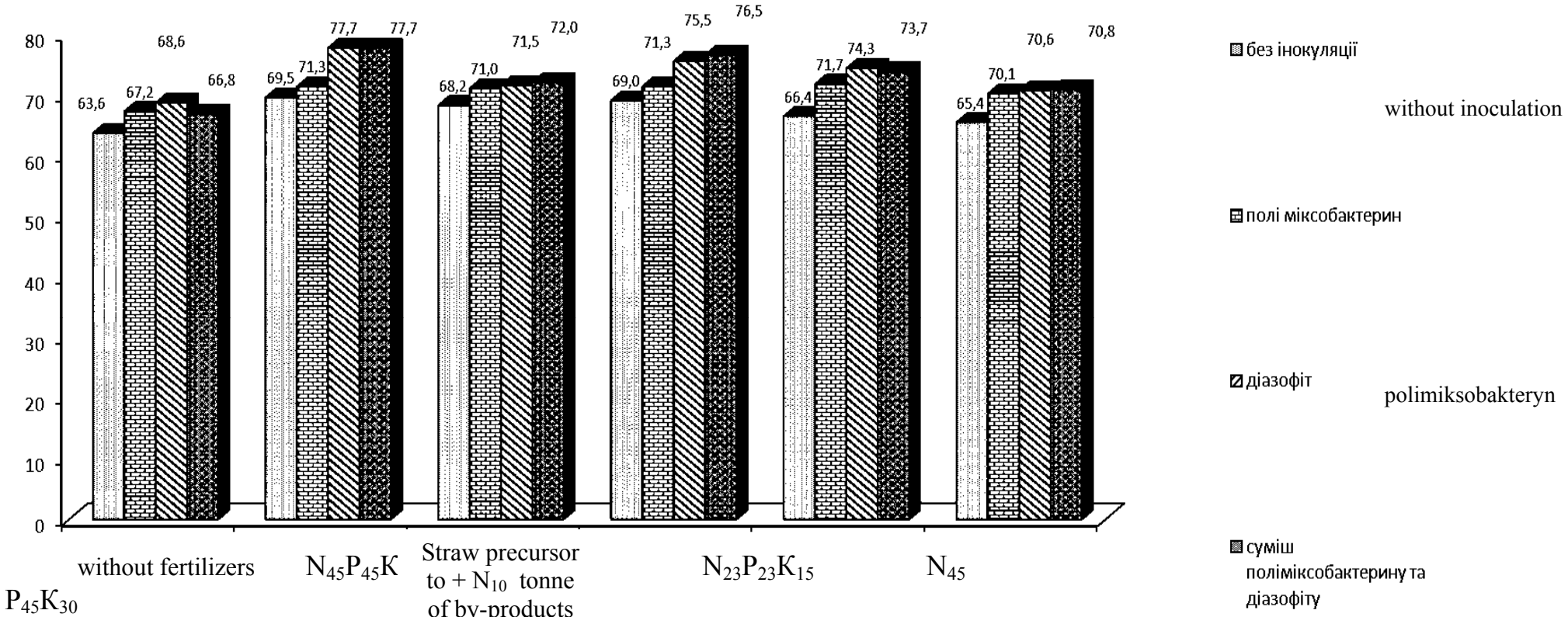

Fig. 1. **Height of hard spring wheat plants depending on the effect of mineral fertilizers and biologica**

(Average for 2010-2012)

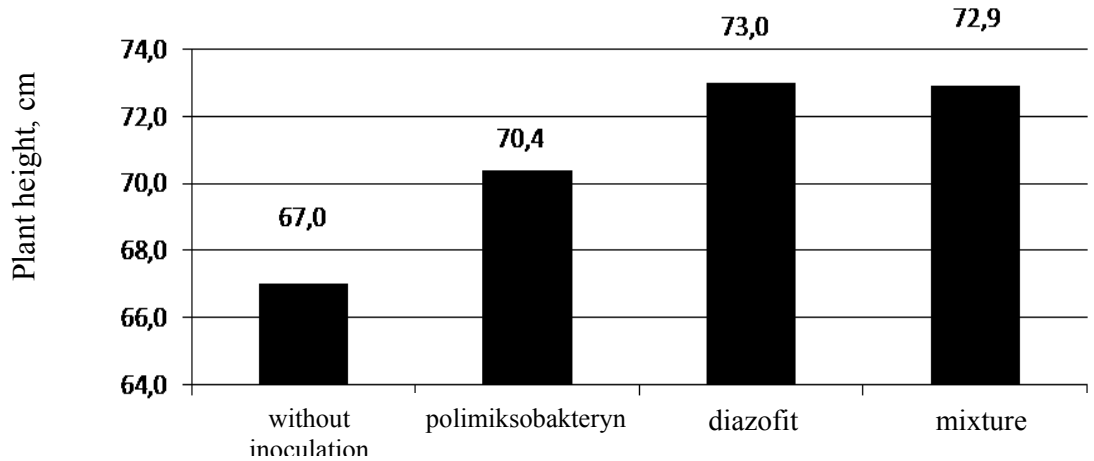

Fig. 2. **Plant height hard spring wheat depending on influence of grain inoculation biological products (2010-2012)**

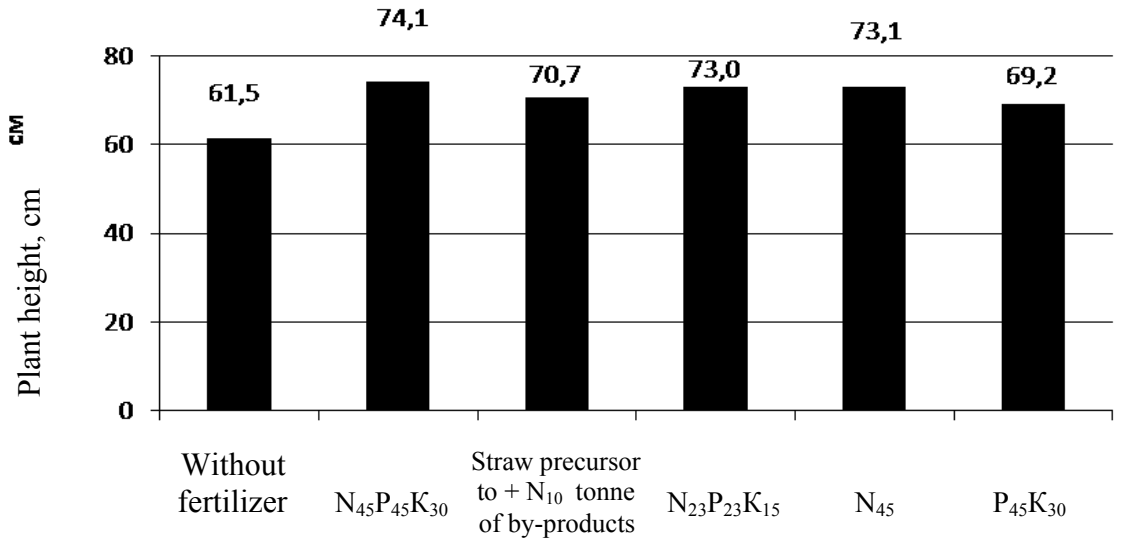

Fig. 3. **Plant height hard spring wheat depending on influence of various backgrounds fertilization (2010-2012)**