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Paper Authors:
Abduazimov Akbar Mukhtorovich[1], Vafoeva Mavluda Bobomurodovna[2]
Urinova Gulnora Ernazarovna[3]

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STUDYING THE EFFECT OF SHEET SUPPLIES AT THE INITIAL STAGES OF WINTER WHEAT DEVELOPMENT

PhD, Abduazimov Akbar Mukhtorovich
doctoral student (PhD), Vafoeva Mavluda Bobomurodovna
researcher, Urinova Gulnora Ernazarovna
Kashkadarya branch of the research institute of grain and leguminous crops

Abstract: The most important agricultural product is wheat food grain. The development of measures to improve the yield and quality of grain of this crop is one of the main tasks of agricultural science and practice. In the course of the technology of cultivation of agricultural crops, it is of particular importance to satisfy their need for microelements. During normal seasonal development, most crops have high nutrient requirements. In order to increase the resistance of plants to adverse environmental factors, as well as to increase yields and improve product quality, the use of growth regulators, liquid fertilizers containing macro- and microelements is increasingly being used.

The article describes the effect of foliar application on the initial stages of the development of winter wheat. When leaf fertilizer must take into account the influence of a significant number of factors that can either increase its effectiveness, or dramatically reduce its positive effect on increasing yields and product quality.

Keywords: wheat, fertilizer, mineral nutrition, foliar nutrition, suspension, chlorophyll, biomass, leaf apparatus.

Introduction

Balanced mineral nutrition is a key factor in the formation of high yields of agricultural crops. Optimization of the forms, doses, timing and methods of fertilizer application increases the economic return in the cultivation of grain crops. A large number of studies indicate that leaf dressings increase the yield and grain quality of winter wheat [1, p.11].

The intensity of assimilation of certain nutrients from the soil by the roots of plants depends on many factors, in particular temperature, humidity, soil aeration, pH and salt composition of the soil, development of the root system, culture. Therefore, a situation often arises when a particular element is present in the soil in sufficient quantities, but due to the low temperature, the roots do not absorb it well, therefore the plant suffers from a deficiency of nutrients.

The optimal solution in this case is foliar feeding. By applying a small amount of appropriate fertilizer on the sheet, you can get a quick result, that is, significantly improve the condition of the plants [2, p.11-12].

In stressful situations (low temperatures, frosts, etc.), the assimilation of nutrients by the root system is insufficient, and this slows down the growth and development rates. Under conditions of low temperatures, they are not fully absorbed, even with the optimal amount of macro cellular compounds and moisture available in the soil [3, p. 242-297].

Sheet top dressing is a tool of operational impact on a plant, which allows during any period of vegetation, and especially in a critical one, to influence the processes determining the future crop and its quality. Foliar nutrition, subject to the use of special fertilizers, is very quickly absorbed by the plant body - 6-8 times faster than through the roots. Sheet top-dressing with multicomponent leaf fertilizers removes short-term deficiencies of nutrients during critical periods of growth and development, increases the plant's ability to absorb nutrients from the main fertilizers, has anti-stress effect [4].

As a result of the studies carried out in order to determine the effect and effectiveness of the pre-sowing seed treatment with growth regulators (biostimulants) on the initial

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biometric indicators of winter wheat varieties Gozgon in the light gray soils of the Kashkadarya region, it was found that the growth regulators (biostimulants) studied in the field an increase in the number and length of roots, bushiness and height of winter wheat plants [5].

The results of the studies have shown that foliar dressing has a positive effect on the amount of chlorophyll grains in the leaves of winter wheat. The use of foliar application in the tillering phase of winter wheat had a positive effect on the number of chlorophyll grains in the leaves of plants, and in particular, by 9.4 units more than the control variant, and this will have a positive effect on the quantity and quality of the future harvest [6].

The scientific application of fertilizers is one of the key factors in the development of agriculture. Because, according to the results of most research and best practices, 45-50% of the crop obtained comes from fertilizers. At the same time, improper use of organic and mineral fertilizers can lead to pollution and the environment and reduce efficiency [7].

In 2007-2008, Ukrainian scientists studied the effect of foliar feeding on increasing the leaf activity of winter wheat and the net productivity of photosynthesis. According to the results of the study, the introduction of foliar feeding at the rate of 2-5 kg / ha ensured the rapid growth of the leaf apparatus of the first and second tier of winter wheat plants. Scientific research has shown that foliar dressing increases the leaf growth of winter wheat to the milk ripening phase and then decreases it. The introduction of extra-mineral dressings ensured the growth of the leaf surface, the maximum value was found in the variant of winter wheat with folicare fertilization at the rate of 5 kg / ha of winter wheat grown under agronomic conditions N30P80K80 + N30. According to the results of the study, such a development of the leaf apparatus of winter wheat provided a yield of 7.51 t / ha [8].

In the Rostov region of the Russian Federation, studies were carried out to study the effect of the use of mineral fertilizers and growth control means on the water supply of winter wheat crops, biological activity and soil fertility. According to the results of the study, the combined use of mineral fertilizers and growth control agents influenced the total water consumption of winter wheat plants by 242-244 mm, and the water consumption coefficient - by 50.1-51.9. In addition, the use of only growth controls led to an increase in yields from 3.05-3.52 t / ha to 3.76-4.28 t / ha, depending on the navigation of winter wheat [9].

Research methods:

In order to study the effect of foliar application in the early stages of winter wheat development, field experience is being conducted at the experimental site of the Kashkadarya branch of the research institute of grain and leguminous crops. The scheme of experience includes 4 options. Cultivated winter wheat varieties Bunyodkor. The total area of plots - 50 m^2, repetition - 3 times.

When choosing a mineral fertilizer, first of all, you should pay attention to its composition. The chemical composition of Ifo PZN liquid fertilizer intended for use as a suspension contains 25% phosphorus (P_2O_5), 5% soluble zinc (Zn), 3% nitrogen (N) and Ph-1-3. Fertilizer was applied in a dissolved form using sprayers.

The first leaf processing of winter wheat with the prepared suspension solution was carried out on December 12, 2020 in the tillering stage. Measurements and evaluation to determine the content of chlorophyll in the leaf apparatus was carried out 5 days after the procedure. The chlorophyll content in the leaves was determined in the tillering phase using a SPAD 502 DL Plus Chlorophyll Meter (USA).

Results and its discussion .

The content of chlorophyll in the control variant of the experiment was 46.5; in the variant with the application of the norm of 3 l/ha, this indicator amounted to 47.3; 5 l/ha amounted to 48.1. It should be noted that before carrying out sheet processing the content of chlorophyll in the sheet apparatus was 45.1.

In the variants with the use of foliar application, as noted above, a significant increase in the chlorophyll content was

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observed compared with the control variant. (table number 1)

Table - 1

Chlorophyll content in the leaf apparatus

№	Options	Chlorophyll content before sheet processing	1-dimension	2-dimension
1	Control	45,1	46,5	40,1
2	3,0 l/ha	45,1	47,3	44,7
3	4,0 l/ha	45,1	47,8	45,4
4	5,0 l/ha	45,1	48,1	46,1

The second measurement and evaluation to determine the content of chlorophyll in the leaf apparatus was performed on January 12, 2021, one month after the procedure.The relatively moderate air temperature in the second half of December and the first half of January created favorable conditions for the growth and development of winter wheat. Subsequently, this was reflected in an increase in the water content, in general, this provoked a decrease in chlorophyll content in the leaf apparatus.

The content of chlorophyll in the control variant of the experiment was 40.1, in the variant with the application of the norm of 3 l/ha, this indicator was 44.7, in the variant with the use of the norm of 4 l/ha it was 45.4, and in the variant with the application of the norm 5 l/ha amounted to 46.1. According to the results of the second measurement, it should be noted that the content of chlorophyll in the leaf apparatus was relatively low.

The results of the data obtained indicate that in the first measurement in the variant with the application of the norm of 3 l/ha, the chlorophyll content was higher by 0.8, in the variant with the norm of 4 l/ha higher by 1.3, and in the variant with the application of the norm 5 l/ha higher by 1.6, with the second measurement in the variant with the application of the norm of 3 l/ha, the chlorophyll content was higher by 4.6, in the variant with the application of the norm 4 l/ha higher by 1, 3, and in the variant with the application of the norm, 5 l/ha is higher by 6.0 compared with the control variant (table number 1).

According to the results of laboratory analyzes, it was noted that with increasing doses of liquid mineral fertilizer, the variants with the use of a suspension on a sheet in parallel showed an improvement in the growth and development of the aboveground plant biomass, as compared to the control one.

In the course of research, it was determined that in the control variant of the experiment, the indicator of bushiness of a single plant was 3.7 pieces, 8 pieces, and in the variant with the application of the norm of 5 l/ha, this indicator was 6.4 pieces.

In the control variant of the experiment, the indicator of the number of roots of a single plant was 11.4 pieces, in the variant with the application of the norm of 3 l/ha, this indicator was 10.5 pieces, in the variant with the use of the norm of 4 l/ha, this indicator was 13.5 pieces, and in the variant with the application of the norm of 5 l/ha, this indicator was 14.4 pcs. The length of the roots was 14.3 cm, 15.5 cm, 18.9 cm and 22.7 cm, respectively. It was also determined that an increase in doses of liquid mineral fertilizer affected the plant height indicator, in the control variant of the experiment, the average plant height indicator was 27.1 cm, in the variant using the norm of 3 l/ha, this indicator was 36.4 cm, in the variant with the use of the norm of 4 l/ha, this indicator was 34.4 cm, and in the variant with the application of the norm of 5 l/ha, this indicator was 46.0 cm.

Table - 2

Plant organs

№	Options	The number of bushiness, pcs	The number of roots, pcs	Root length, cm	Plant height, cm
1	Control	3,7	11,4	14,3	27,1
2	3,0 l/ha	4,2	10,5	15,5	36,4
3	4,0 l/ha	5,8	13,5	18,9	34,4
4	5,0 l/ha	6,4	14,4	22,7	46,0

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According to the general results, it was determined that after processing the plants on a leaf, the bushiness of plants increased by 2.7 pcs, the number of roots increased by 3 pcs, the length of the roots was 8.4 cm and the height of the plants was 18.9 cm compared with the control variant (table number 2).

An increase in the rates of application of liquid mineral fertilizer also has a noticeable effect on plant biomass. In the course of the research it was determined that the indicator of wet mass of the plant root in the control variant of the experiment was 3.9 g, and dry 1.3 g, in the variant with the application of the norm of 3 l/ha, these indicators were 5.7 and 1.6 g, the variant with the application of the norm of 4 l/ha, these indicators amounted to 9.3 and 6.8 g, and in the variant with the application of the norm of 5 l/ha, these indicators were 10.4 and 6.7 g (table number 3).

The indicator of the wet weight of the stem in the control variant was 11.4 g, and the wet weight of the sheet was 16.6 g, in the variant with the application of the norm of 3 l/ha these figures were 23.0 g and 27.5 g, in the variant with the use of the norm l/ha, these figures were 27.3 and 35.8 g, while in the variant using the norm of 5 l/ha, these figures were 28.8 g and 37.0 g The total wet mass in the control variant was 31.9 g, and in the variant using the norm of 5 l/ha, a significant increase in this indicator was observed, which amounted to 74.2 g.

Table - 3

Plant biomass

№	Options	Wet weight, g				Dry weight, g			
		root	stem	sheet	common	root	stem	sheet	common
1	Control	3,9	11,4	16,6	31,9	1,3	1,9	3,1	6,3
2	3,0 l/ha	5,7	23,0	27,5	56,2	1,6	3,6	4,3	9,5
3	4,0 l/ha	9,3	27,3	35,8	72,4	2,6	6,8	5,8	15,2
4	5,0 l/ha	10,4	28,8	37,0	74,2	3,3	6,7	6,2	16,2

The dry weight of the root in the control variant was 1.3 g, and in the variants with an increase in the application rates of fertilizers, this indicator was 1.6 g, 2.6 g, and 3.3 g, respectively. The dry weight of the stem in the control variant was 1.9 g, and the dry weight of the leaf was 3.1 g, in the variant using the norm of 3 l/ha these figures were 3.6 g and 4.3 g, in the variant using the norm 4 l/ha, these figures were 6.8 g and 5.8 g, and in the variant using the norm of 5 l/ha, these figures were 6.7 g and 6.2 g. The total dry mass in the control variant was 6.3 g, in the variant using the norm of 3 l/ha, this indicator was 9.5 g, in the variant using the norm of 4 l/ha, this indicator was 15.2 g, and in the variant with the application rate of 5 l/ha, this figure was 16.2 g

In the study in laboratory conditions, the approximate content of mineral elements in the plant composition 40 days after treatment determined that the total nitrogen content increased from 0.18% to 0.24%, ash from 0.05% to 0.08%, under the influence of zinc and Ph contained in the composition of the suspension of sodium from 0.087 to 0.195%, calcium from 0.18% to 0.19%, magnesium from 0.76% to 0.83% (table number 4).

Table - 4

The approximate content of mineral elements in the composition of the plant,%

№	Options	N	ash	Na_2O	CaO	MgO
1	Control	0,18	0,05	0,087	0,17	0,76
2	3,0 l/ha	0,20	0,06	0,105	0,19	0,81
3	4,0 l/ha	0,23	0,06	0,165	0,19	0,81
4	5,0 l/ha	0,24	0,08	0,195	0,19	0,83

Conclusion:

In each of the periods of plant growth and development, different elements are needed. According to the results of research conducted at the initial stages of winter wheat development, the positive effect of foliar feeding was determined. The most positive effect on the indicators of chlorophyll content in the leaf apparatus, bushiness, plant organs, biomass and the content of mineral elements was noted in the variant with the use of a norm of 5 l/ha. Adequate supply of nutrients to plants at the beginning of the growing season in stressful situations (low temperatures, frost,

lack of moisture, etc.) "programs" a positive effect on stable growth and development of plants in general, which ultimately affects the increase in yield and product quality.

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