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" __ " ________________________ 2020

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RESEARH REPORT

on the topic:

"Study of the effectiveness when using the EKO-SP agrochemicals based on humic substances for spring wheat and spring barley crops in the black earth soils of the Kursk region"

for the year 2020

Executors:

Head of the Laboratory of Cultivation Technologies for Field Crops Growing and Lands Environmental Assessment of FSBSI "KURSK FARC", Doctor of Agricultural Sciences, Professor

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Kursk 2020

CONTENT

INTRODUCTION

Recently aggravated economic and environmental problems require significant changes and applied technologies towards their biologization and resource conservation. This opens the door for the development of new directions in the cultivation of agricultural crops using biological plant protection products, growth regulators, and bio- and microelement fertilizers.

The **EKO-SP** fertilizer obtained on the basis of humic substances from plant raw materials (lowland peat), containing in its composition humic and fulvic acids, plant hormones, amino and simple organic acids, microelements in a chelated form, useful soil microflora is among them. EKO-SP is an inducer of plant immunity, it has adaptogenic properties, it promotes anti-stress resistance of plants to diseases and adverse environmental conditions, it has high chemical purity and solubility, it increases productivity and product quality. The product is intended for seed treatment and foliar treatment of plants and can be used practically at all stages of the growing season (from seed treatment to additional fertilizing after the stress suffered by the plants).

Working purpose: to determine the effectiveness of using the EKO-SP agrochemical based on humic substances on grain crops (spring wheat, spring barley), the effect of the product on the yield and quality of grain in the soil and climatic conditions of the Kursk Region

1. Study procedure and conditions

The study was carried out in the laboratory of technologies for the cultivation of field crops and environmental assessment of lands of the FSBSI "Kursk Federal Agrarian Research Center", (Structural Subdivision of "Kursk Research Institute of Agroindustrial Production") in crop rotation with the following crop rotation: 1. Spring barley, 2. Soya, 3. Spring wheat

Field Study scheme and content of variants

Variant	Application to the soil for pre-sowing cultivation	Crop treatment in the tillering phase	Crop treatment in the phase of the beginning of stem elongation
Spring wheat			
1. Control, no treatments	**--**	**--**	**-**
2. EKO-SP	**2.5 l/ha**	**1 l/ha**	**1 l/ha**
Spring barley			
1. Control, no treatments	**--**	**--**	**-**
2. EKO-SP	**2.5 l/ha**	**1 l/ha**	**1 l/ha**

The test was repeated 3 times, the variants were arranged systematically in one tier. The plots had the shape of an elongated rectangle. The size of the sowing plot was 5.4 x 50 = 270 m^2, registration plot - 200 m^2 (4x50).

Fieldwork on the test site was carried out in the best agrotechnical terms using the released varieties in the region: spring wheat - Daria and spring barley Prometheus. Seeds that meet the requirements of the 1st class of the sowing standard with a piece seeding rate were used for sowing: spring wheat - 5.5 million, spring barley - 5.0 million of viable grains per hectare. Sowing method - row seeding (row spacing 15 cm) followed by rolling with star-wheel rakes. The seeding depth is 4-5 cm. Mineral nutrition status–N30P30K30.

The soil of the testing site is represented by typical thick heavy loamy black soil. The humus content in the arable layer is 6.0-6.2%, mobile phosphorus (according to Chirikov) - 10.1-14.5, exchangeable potassium (according to Maslova) - 16.8-19.0 mg/100 g of soil. The reaction of the soil medium is neutral (pH 6.8-7.0) (Table 1).

Table 1: Agrochemical characteristics of the soil (testing site)

Indicator	Horizon				
	0-10	20-30	50-60	70-80	90-100
Humus, %.	6.2	6.0	5.9	4.3	3.1
pH of water suspension	5.9	6.3	6.6	7.2	7.9
Hydrolytic acidity, meq per 100 g	3.37	3.14			
Total absorbed bases, mg/eq per 100 g	41.8	41.6	39.7	37.1	--
Total nitrogen,%	0.34	0.34	0.26	0.19	0.16
Hydrolyzable nitrogen, mg/kg	75	67	--	--	--
Gross phosphorus,%	0.14	0.14	0.13	0.11	0.13
Mobile phosphorus (according to Chirikov), kg/ha	145	146	101	99	82
Exchangeable potassium (according to Maslova), kg/ha	164	168	146	138	133

Fig. 1: General view of the test studying the effectiveness of the EKO-SP agrochemical based on humic substances on crops of spring barley, the phase of stem elongation in 2020.

Fig. 2: General view of the test studying the effectiveness of the EKO-SP agrochemical based on humic substances on crops of spring barley, the phase of ear formation in 2020.

Fig. 3: General view of the test studying the effectiveness of the EKO-SP agrochemical based on humic substances on crops of spring wheat, the phase of ear formation in 2020.

The treatment of spring grain crops was carried out with a shoulder sprayer in accordance with the test scheme (Fig. 4).

Fig. 4: Treatment of spring barley crops with the EKO-SP agrochemical based on humic substances, 2020

To assess the effectiveness of the product during the entire growing season, we observed plant growth and development, the phytosanitary state of crops, productivity, and grain quality (Fig. 5).

Fig. 5: Recording for the prevalence of leaf-stem diseases

The harvesting and accounting of the yield were carried out with a Sampo self-propelled combine by direct combining. In this case, the entire area of the registration plot was cut, the grain was weighed in bags on decimal scales (Fig. 6, 7). The yield was calculated for 100% purity and 14% grain moisture.

Fig. 6: Harvesting and registration of the spring barley harvest using the Sampo combine, 2020

Fig. 7: Harvesting and registration of the spring wheat harvest using the Sampo combine, 2020

The structure of the yield was determined according to the methodology of the Gossortoset (Methodology of variety testing…. 1985; Makarova V.M., 1995);

In grain samples of spring barley, the content of crude protein was determined by multiplying the amount of total nitrogen by a factor of 5.7, nitrogen index according to Klimashevsky E.L., (1991), starch - by polarimetric method (according to Evers), extractives (GOST 12136-77), husk content (GOST-10846-76), grain nature (GOST-10840-76).

The determination of the economic efficiency from using the EKO-SP product was carried out according to the generally accepted method. To process the experimental data, the dispersion method of mathematical analysis was used, the technique of which is described in detail in the study of B.A. Dospekhov (1985).

2. Meteorological conditions of the agricultural year 2020

The meteorological conditions of the agricultural year 2020 were satisfactory for the growth and development of spring grain crops. The growing season of spring grain crops was characterized by warm and humid weather. The amount of precipitation in April was 20.2 mm (their multi-annual amount is 35 mm), with the average daily temperature of this period being 0.6°C below the norm (6.7°C) (Table 2).

The average monthly temperature in May was 1.9°C below the norm (13.8°C), and the amount of precipitation was 74.1 mm, or 148.1% of their average multi-annual value (50mm).

Table 2: Meteorological conditions of the agricultural year 2020 (according to the Petrinskaya meteorological station)

Month		Average multi-annual temperature, °C	Average monthly temperature, °C	Average multi-annual precipitation value, mm	Average monthly precipitation value, mm
January	2020	-10.3	-1.1	34	22.2
February		- 8,0	-1.4	33	36.0
March		- 2,9	4.0	32	18.1
April		6.7	6.1	35	20.2
May		13.8	11.9	50	74.1
June		17.3	20.7	59	46.7
July		18.9	21.0	71	72.6
August		18.1	18.7	64	11.8

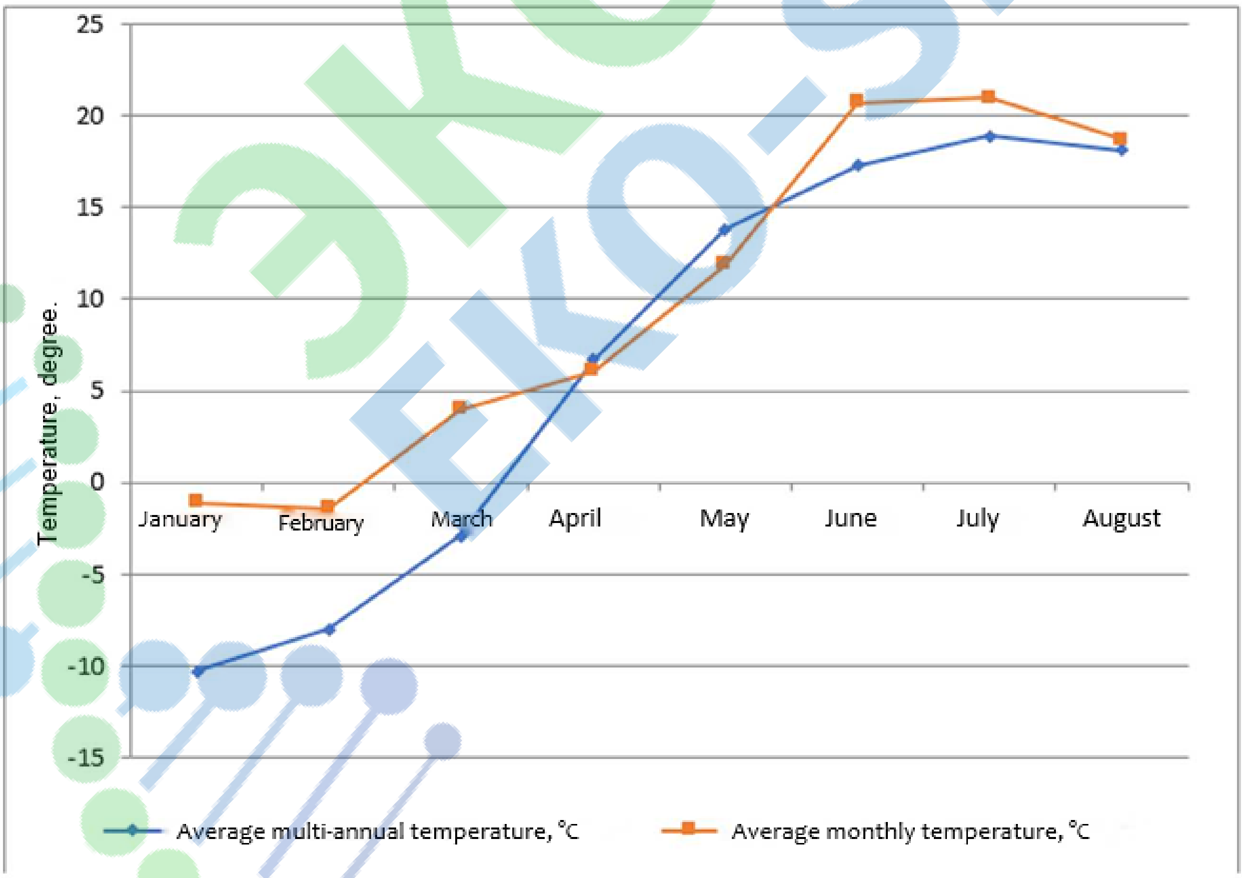


Fig. 8. Dynamics of average monthly air temperatures, 2020

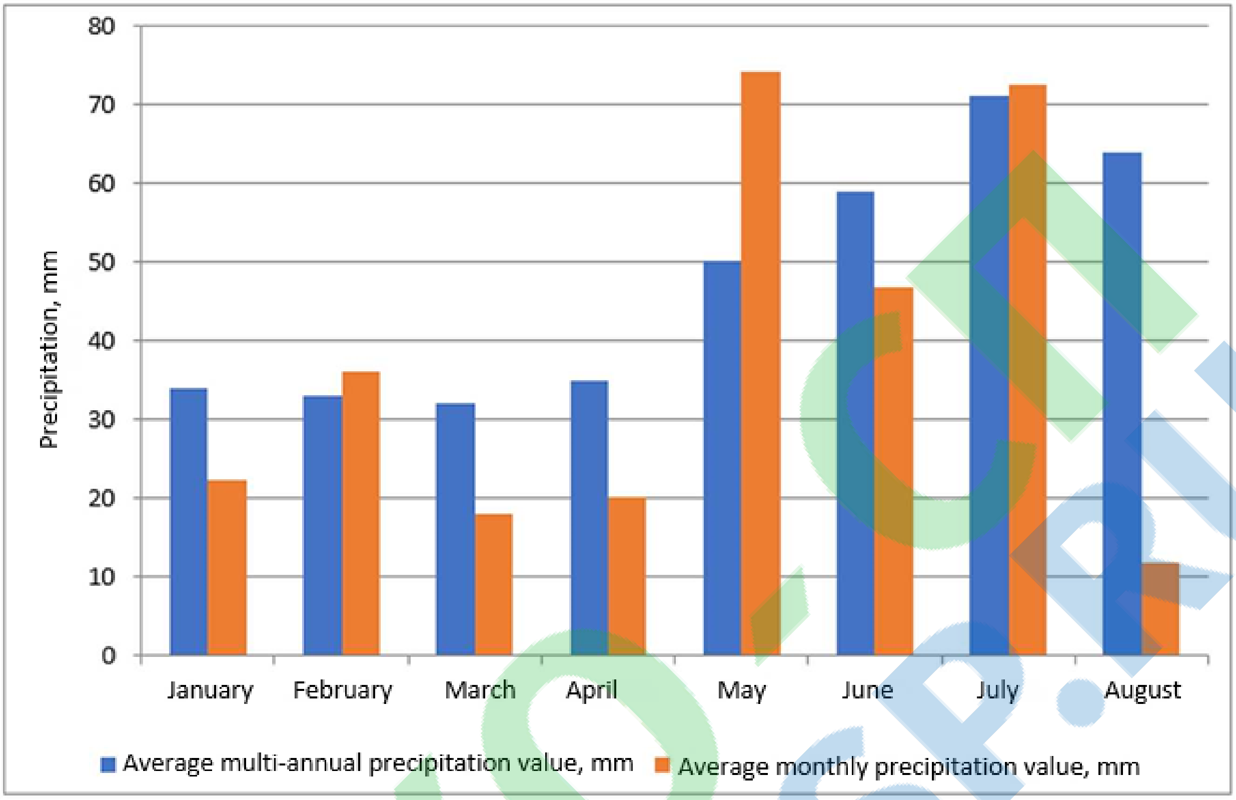


Fig. 9: Precipitation dynamics, 2020

The summer of 2020 began on April 25 with the transition of the average daily air temperature through 15°C towards a further increase.

On average, in June, the air temperature was 20.7°C, which is 3.4°C higher than the norm, and the amount of precipitation was 46.7 mm, or 79.2.5% of their average multi-annual amount (59 mm).

The weather in July was warm and humid, the average monthly temperature in July was 21.0°C with an average multi-annual temperature of 18.9°C, and the amount of precipitation was 72.6 mm, or 102.2% of the norm (the average long-term sum is 71 mm).

Thus, the average daily temperature of the growing season of spring grain crops (April-July) was 14.9°C (the average multi-annual temperature is 14.2°C), and the amount of precipitation was 213.6 mm, or 99.3% of their average annual amount (215.0 mm).

3. STUDY RESULTS

3.1. Laboratory research.

The results of germination of spring grain seeds under laboratory conditions indicate that the treatment of seeds with the EKO-SP agrochemical based on humic substances, in comparison with the control variant, increased the seed germination energy (on the 3rd day of germination) of spring wheat by 11%, and laboratory germination (on the 7th day of germination) - by 2% (Table 3).

Table 3: Influence of EKO-SP organic mineral fertilizer on germination and laboratory germination of spring wheat seeds

Variant	Germination readiness, % (number of germinated seeds on the 3rd day)	Laboratory germination,% (number of germinated seeds on the 7th day)
1. Control (no treatments)	87	98
2. Seeds treated with EKO-SP (4.5 ml /1 l of water)	98+11%	100+2%

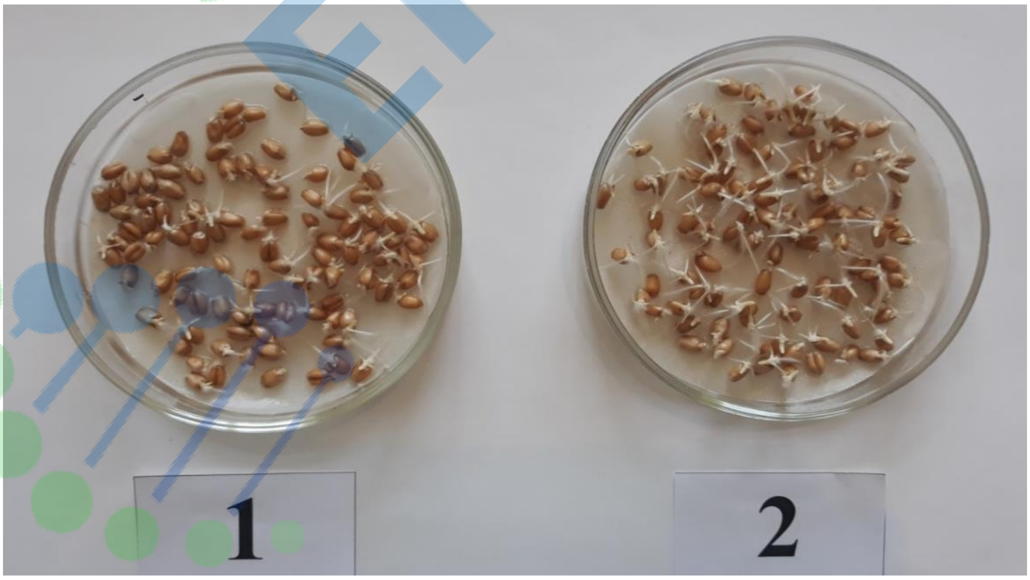


Fig. 10: Spring wheat seeds on the 3rd day of germination (1 - control, 2 - treated with EKO-SP

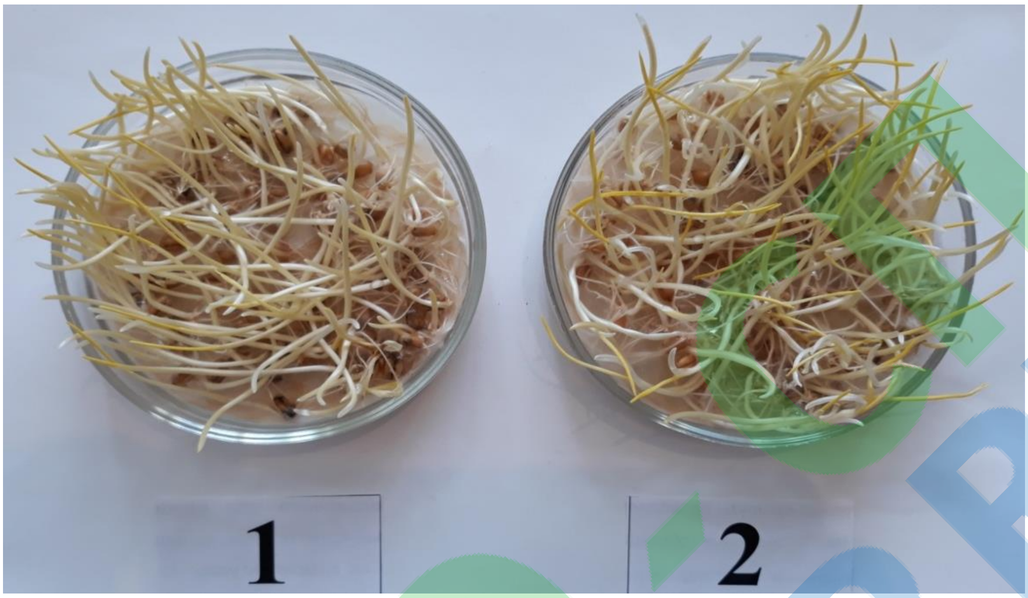


Fig. 11: Spring wheat seeds on the 7th day of germination (1- control, 2 - treated with EKO-SP

Treatment of spring barley seeds (chalk culture) in laboratory conditions with the EKO-SP agrochemical based on humic substances at a dose of 0.07 l/t led to an increase in seed germination energy by 17%, and laboratory germination by 4% in comparison with the control (Table 4).

Table 4: Influence of EKO-SP organic mineral fertilizer on germination and laboratory germination of spring barley seeds

Variant	Germination readiness, % (number of germinated seeds on the 3rd day)	Laboratory germination,% (number of germinated seeds on the 7th day)
1. Control (no treatments)	81	87
2. Seeds treated with EKO-SP (4.5 ml / 1 liter of water)	88 + 17%	91+4%

Fig. 12: Spring barley seeds on the 3rd day of germination (1- control, 2 - treated with EKO-SP

Fig. 13: Spring barley seeds on the 7th day of germination (1 - control, 2 - treated with EKO-SP)

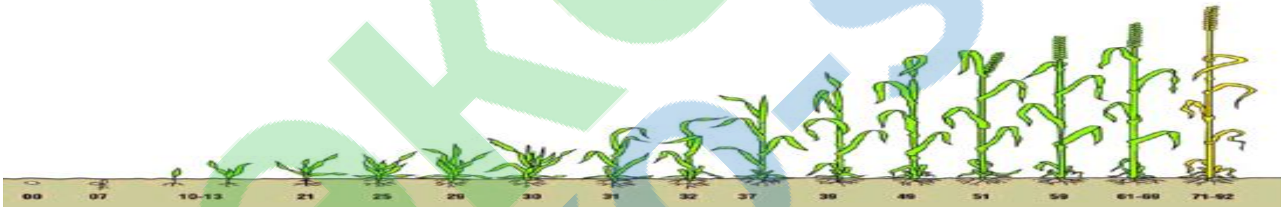
3.2. Field study

3.2.1.The effectiveness of the EKO-SP agrochemical based on the humic substance on crops of spring-sown cereals

The results of the conducted studies indicate the high efficiency of the EKO-SP agrochemical based on humic substances on spring crops in the conditions of 2020.

Sowing of spring wheat (Daria variety) was carried out on April 13, and of spring barley (Prometheus variety) - on April 11, 2020. Seedlings of spring wheat in the experiment appeared on the 12th day after sowing (04/26/2020), spring barley on the 13th day (04/24/2020) simultaneously in all variants under study. The pre-plant application of the EKO-SP agrochemical and treatment of crops had practically no effect on the beginning of the phenological development phases of spring grain crops: tillering, stem elongation, ear formation, and grain ripeness (Table 5).

Table 5: Effect of EKO-SP on the beginning of phenological phases of spring grain crops development, 2020



Var-iant	00-09	10-19	20-29	30-39	40-49	50-59	61-69	99
	Crop-seedling	Germinative sprouting growth, Tillering		Stem elongation	Earing		Flowering	Full ripeness
				Spring wheat (Daria)				
1	04/13/2020-04/26/2020	05/27/2020		05/23/2020	06/18/2020		06/24	07/24
2	04/13/2020-09/26/2020	05/27/2020		05/23/2020	06/18/2020		06/24	07/24
				Spring barley (Prometeus)				
1	04/11/2020-04/24/2020	05/24/2020		06/04/2020	06/19/2020		-	07/26/
2	04/11/2020-04/24/2020	05/24/2020		06/04/2020	06/19/2020		-	07/26/

Calculation of the degree of density of spring wheat and spring barley according to the variants of the experiment showed, that the application of the EKO-SP product for pre-sowing cultivation practically did not affect the field germination of seeds, there was only a tendency to increase the field germination of spring grain crops by 1-2% in comparison with the control (Table 6).

Table 6: Effect of the EKO-SP product on the field germination of seeds of spring wheat, spring barley, 2020

Variants	The number of germinated plants per 1 m^2	Field germination, %
Spring wheat		
1. Control	502	91
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	506	92
Spring barley		
1. Control	460	92
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	471	94

The application of the EKO-SP agrochemical based on humic substances to the soil for pre-sowing cultivation promoted better growth and development of grain crops, the formation of a heavier green matter, and root system in comparison with the control variant.

Fig.14: The effect of the EKO-SP agrochemical, based on humic substances, on the growth and development of spring wheat plants, 2020

1 2

Fig.15: The effect of the EKO-SP agrochemical, based on humic substances, on the growth and development of spring barley plants, 2020

The phytosanitary state of spring grain crops in 2020 was characterized by a moderate infectious background. The affection of plants with rhynchosporium (Rhynchosporiumsecalis) and helminthosporium (Helminthosporium) was observed on crops of spring barley, and affection of septoria (Septorianodorum) - on crops of spring wheat.

Determination of the vulnerability of spring wheat plants to septoria blight was carried out in the beginning phase of ear formation. The use of the EKO-SP agrochemical based on humic substances on spring grain crops had a restraining effect on the spread of these diseases.

The strongest spread of septoria blight on spring wheat was observed in the control variant - 25.3%. The preplant application of the EKO-SP at a dose of 2.5 l/ha and repeated treatment of crops at the tillering phase and phase of the beginning of stem elongation at a dose of 1 l/ha contributed to a decrease in the plant vulnerability to septoria by 5.5%, the biological effectiveness of the product was 21.7% (Table 7).

Table 7: Influence of the EKO-SP agrochemical based on humic substances on the prevalence of leaf-stem diseases of spring wheat, 2020

Variants	Septoriosis	
	prevalence,%	biological efficiency,%
1. Control - no treatments	25.3	
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	19.8-5.5	21.7

The preplant application of the EKO-SP agrochemical based on humic substances for the spring barley at a dose of 2.5 l/ha and treatment of crops in the tillering phase and the phase of the beginning of stem elongation at a dose of 1 l/ha reduced the prevalence of rhynchosporiosis by 3.6%, helminthosporiosis - by 3.1%, with the prevalence of these diseases in the control variant being equal to 14.3 and 17.9% respectively. The biological efficacy of the EKO-SP preparation was as follows: for rhynchosporium - 25.2%; for helminthosporiosis –17.3% (Table 8).

Table 8: Influence of the EKO-SP agrochemical based on humic substances on the prevalence of leaf-stem diseases of spring barley, 2020

Variants	Rhinhosporiosis		Helminthosporiosis	
	preva-lence,%	biological efficiency,%	preva-lence,%	biological efficiency,%
1. Control - no treatments	14.3	-	17.9	-
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	10.7-3.6	25.2	14.8-3.1	17.3

The relatively high biological effectiveness of the EKO-SP product in suppression the prevalence of leaf-stem diseases, in our opinion, is due to the fact that this product enhanced the growth and development of plants, contributed to the production of more powerful and developed plants, and, as a result, to an increase in the yield of spring grain crops.

The use of the EKO-SP agrochemical based on humic substances on crops of spring grain crops in 2020 had a significant impact on the yield and grain quality. The preplant application of the EKO-SP at a dose of 2.5 l/ha and repeated treatment of crops at the tillering phase and phase of the beginning of stem elongation at a dose of 1 l/ha increased the yield of spring wheat by 5.1 centner/ ha, with a yield in the control variant equal to 30.7 centner/ha.

The use of the EKO-SP agrochemical based on humic substances on crops of spring barley at the same time and in the same doses contributed to an increase in yield by 3.7 c/ha or 13.8% in comparison with the control (Table 9).

Table 9: Influence of the EKO-SP agrochemical based on humic substances on the yield of grain crops (spring wheat, spring barley), 2020

Variant	Replications			Average yield, c/ha	Increase	
	1	2	3		c/ha	%
Spring wheat						
1. Control	30.1	31.7	30.5	30.7		
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	35.5	35.3	36.6	35.8	5.1	16.6
LSD05					3.4	
Spring barley						
1. Control	26.0	27.5	27.0	26.8		
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	29.6	31.3	30.7	30.5	3.7	13.8
LSD05					2.6	

The preplant application of the EKO-SP and repeated treatment of crops at the tillering phase and phase of the beginning of stem elongation increased the number of productive stems of spring wheat by 24 pcs/m, the number of grains in an ear by 1.1 pcs., the weight of 1,000 grains by 0.9 g, grain size - by 18 g/l.

The use of EKO-SP on spring barley crops increased the number of productive stems by 27 pcs./m, the number of grains in an ear - by 0.4 pcs., the mass of 1,000 grains - by 0.7 g, the grain size - by 20 g/l; (Table 10).

Table 10: Influence of the EKO-SP agrochemical based on humic substances on the structure elements of the yield of spring grain crops, 2020

Variants	Number of plants, pcs/m²	Number of stems to harvest, pcs/m²		The number of grains per ear	Weight of 1,000 grains, g	Nature of grain, g/l
		total	efficient			
Spring wheat						
1. Control - no treatments	502	662/1.32	562/1.12	25.6	32.0	772
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	506	688/1.36	586/1.16	26.7	32.9	790
Spring barley						
1. Control - no treatments	460	570/ 1.24	524/1.14	17.8	43.8	607
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	471	598/ 1.27	551/1.17/	18.2	44.5	627

The use of the EKO-SP product on spring wheat crops influenced the grain quality (Table 11). Thus, the preplant application of the EKO-SP and repeated treatment of crops at the tillering phase and phase of the beginning of stem elongation increased the crude gluten content in the grain by 0.8%, the protein content - by 0.3% in comparison with the control.

Table 11: Influence of the EKO-SP agrochemical based on humic substances on the quality of spring wheat grain, 2020

Variants	Crude gluten content,%	Protein (on dry basis)	Starch (on dry basis)	Grain moisture, %
1. **Control** - no treatments	24.1	13.6	65.2	13.3
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	24.9	13.9	65.9	13.0

The use of the EKO-SP product ensured the production of spring barley grain that met the brewing standards: husk content was at the level of 8.55%; the starch content was 51.6%, the protein content was 11.2%. The grain size in this variant was estimated at 96.4% (with the standard 95% for class 1) (Table 12).

The preplant application of the EKO-SP and repeated treatment of crops at the tillering phase and phase of the beginning of stem elongation contributed to a certain increase in the protein content in spring barley grain, by 0.2%, but this increase was within the requirements for brewing barley (9-12%).

Table 12: Influence of the EKO-SP agrochemical based on humic substances on the quality of spring barley grain, 2020

Fertilization level	Grain size,%	Content, %		Husk content, %
		Protein (on dry basis)	Starch (on dry basis)	
1. Control,	95.3	11.0	51.4	8.47
2. EKO-SP (2.5 l/ha), preplant application of the EKO-SP + treatment of crops in the tillering phase (1 l/ha) + treatment of crops in the phase of stem elongation (1 l/ha)	96.4	11.2	51.6	8.55

Calculations of economic efficiency showed that the use of the EKO-SP agrochemical based on humic substances when applied for pre-sowing cultivation and processing of spring grain crops was economically profitable (Table 13).

Table 13: Economic efficiency of using the EKO-SP agrochemical based on the humic substance on crops of spring-sown cereals, 2020

Indicator	Cost of the product, rub./ l	Application dose, l/ha	Costs per hectare, rubles	Yield c/ha	Increase in yield from the use of the product, c/ha	Cost of increase, rub.	Conditionally net income, per hectare, rubles
Spring wheat							
1. Control	-	-	-	30.7	-		-
2. EKO-SP	160	4.5 l	720+3B	35.8	**5.1**	6120	5400-3B
Spring barley							
1. Control				26.8			
2. EKO-SP	160	4.5 l	720+3B	30.5	**3.7**	3700	2980-3B

Note: the cost of 1 ton of barley grain is 10,000 rubles, one ton of wheat is 12,000 rubles.
3.B. - the cost of applying the product

So, the preplant application of the EKO-SP and repeated treatment of crops at the tillering phase and phase of the beginning of stem elongation increased the yield of spring barley by 3.7 c/ha, thereby increasing the cost of gross production by 3700 rubles and, given the low costs, associated with the cost of the product (720 rubles/ha) and the cost of seed treatment provided the receiving of 2980 rubles of conditionally net income minus the costs associated with the actual introduction of the product. Since the product is recommended to be used in tank mixtures for the treatment of plant protection products and fertilizing, the agro-manufacturer does not bear additional costs respectively.

The effectiveness of the EKO-SP product on spring wheat crops was even higher: the increase in yield from the use of the EKO-SP product amounted to 5.1 c/ha, the cost of gross production increased by 6,120 rubles, providing 5,400 rubles of conditionally net income per hectare. The calculation was made based on the cost of the EKO-SP as of 2020 - 160 rubles per liter.

CONCLUSION

The test results of the EKO-SP agrochemical based on humic substances, carried out under the conditions of the test year 2020, indicate its high efficiency in crops of spring grain crops. The preplant application of the EKO-SP at a dose of 2.5 l/ha and repeated treatment of crops at the tillering phase and phase of the beginning of stem elongation at a dose of 1 l/ha contributed to an increase in the yield of spring barley by 3.7 c/ha, of spring wheat - by 5.1 c/ha, increased the gluten content in the grain of spring wheat by 0.8%, increased the grain size of spring barley, the content of starch and extractives in it, contributed to a slight increase in the protein content (by 0.2%), but this increase was within the limits of the requirements for brewing barley (9-12%).

The use of the EKO-SP product on spring grain crops was economically profitable due to its high efficiency, low cost, and low application rates.

Doctor of Agricultural Sciences, Professor ______________________ V.I. Lazarev

Mathematical processing of spring wheat crops data, 2020.

30.1	31.7	30.5
35.5	35.3	36.6

30.1	31.7	30.5
35.5	35.3	36.6

Analysis results

Variant	Qty	Average	Dispersion	Average quarterly deviation	Error	Accuracy%
1	3	30.766666	0.6933338	0.8326667	0.48074	1.5625364
2	3	35.799999	0.4899992	0.6999994	0.40414	1.1288962
By experience	6	33.283333	8.0736685	2.8414202	1.16	3.4852428

Source variation	Quarter sum	degree of variance	Dispersion	Ffact	Ftab095.	Influence%
Total	40.36858	5				
Repetitions						
Variants	38.00162	1	38.001621	64.220001	7.7	94.13662
Random	2.366965	4	0.5917412			
					HCP=3.4	
	Influence force indication error	0.0146585	Availability F =	64.220001		

The test revealed SIGNIFICANT differences in the variants!

Modeling group ... SNIISH. (8-253) 3-22-04

Mathematical processing of spring barley crops data, 2020.

26	27.5	27
29.6	31.3	30.7

26	27.5	27
29.6	31.3	30.7

Analysis results

Variant	Qty	Average	Dispersion	Average quarterly deviation	Error	Accuracy%
1	3	26.833334	0.5833333	0.7637626	0.44096	1.6433237
2	3	30.533333	0.7433325	0.8621674	0.49777	1.6302594
By experience	6	28.683332	4.6376772	2.1535268	0.87917	3.0651028

Source variation	Quarter sum	degree of variance	Dispersion	Ffact	Ftab095.	Influence%
Total	23.18851	5				
Repetitions						
Variants	20.53499	1	20.534994	30.955166	7.7	88.55677
Random	2.653514	4	0.6633786			
					HCP=2.6	
	Influence force indication error	0.0286081	Availability F =	30.955166		

The test revealed SIGNIFICANT differences in the variants!

Modeling group ... SNIISH. (8-253) 3-22-04