V.V. Borisenko et al /J. Pharm. Sci. & Res. Vol. 10(10), 2018, 2626-2627

ISSN:0975-1459
Journal of Pharmaceutical Sciences and Research
www.jpsr.pharmainfo.in

Effect of "ECOSS" BioGumate on the Growth and Development of Winter Wheat of Various Varieties

V.V. Borisenko[1], I.S. Zholobova[1], A.I. Petenko[1], A.N. Gneush[1], N.A. Yurina[2]

[1]Kuban State Agrarian University named after I.T. Trubilin,350044, Krasnodar, Russian Federation, 13 Kalinin Str.
[2]Krasnodar Research Centre for Animal Husbandry and Veterinary Medicine,Krasnodar, Znamensky Settlement, 4 Pervomaiskaya Str.

Abstract

The paper presents the results of studies on the use of ECOSS-20 BioHumate preparation, which has a prolonged effect on the plant at all stages of its growth and development from the germination of the seeds to the ripening of the crop. Humic preparation of ECOSS-20 was produced first in the south of Russia by the Kuban Agrobiocomplex. The unique technology of production of ECOSS-20, based on the latest achievements of science with the use of modern equipment with deep purification from impurities, which makes it possible to extract from the manure of cattle and save the whole complex of biologically active substances in the preparation - humic, hymatomelanic and fulvic acids, vitamins, macro and microelements in the form of bioavailable organic compounds. The data of scientific experience on the effect of the preparation on winter wheat of various varieties are given. The obtained results of the experiment testify to the high biological efficiency of the ECOSS-20 BioHumate under study. In order to stimulate the formation of a sufficient biomass of the plant for successful overwintering due to climatic or other negative conditions, in the following scientific experiment presented in this article, the effect of Biogum ECOCS-20 on biometric indicators of winter wheat was studied. The production technology, which ensures stable chemical composition of the preparation, including biologically active compounds, ensures high growth and development of winter wheat.

Keywords: humic preparation, biopreparation, humic acids, wheat, yield, seed treatment.

INTRODUCTION

Humic acids, which have a much larger molecular weight, affect the flowering period and the appearance of ovaries after hydrolytic cleavage to a low molecular level and the appearance of the ability to penetrate into the plant cell [1-3]. Thus, ECOSS-20 BioHumate, in contrast to other preparations, is a fertilizer of prolonged action, it affects the plant at all stages of its growth and development from the moment of germination of seeds and to the ripening of the crop.

The composition of the fertilizer also includes a useful microflora and when applied to the soil, it acts as an activator of soil microflora. Studies have shown that the number of bacteria in the preparation is quite high. The most interesting is a bacterial aerobic microflora, which possesses the properties of a plant growth stimulator [4-7].

ECOSS-20 BioHumate - is a dark brown liquid with a characteristic odor. Each liter of the preparation contains at least 20 g of humic and fulvic acids, amino acids, useful microorganisms, as well as a complex of trace elements.

ECOSS-20 BioHumate is an ecologically safe preparation, humic acids for which are isolated as a result of processing of manure of cattle in biodynamic fermenters with the participation of agro-beneficial microorganisms. It does not require special safety measures in use, it does not harm the environment, which is especially important for the ecologization of agriculture. It is non-toxic, its residual amounts in plants are not detected. The preparation is used in very low concentrations, quickly included in the process of plant metabolism.

Humic preparation of ECOSS-20 was produced first in the South of Russia by the Kuban Agrobiocomplex. The technology of its production includes the use of modern equipment with deep purification from impurities, which makes it possible to extract from the cattle manure and keep in the preparation the whole complex of biologically active substances - humic, hymatomelanic and fulvic acids, vitamins, macro and microelements in the form of bioavailable organic compounds. The concentration of humic acids in the preparation is stable, which makes it possible to prepare working solutions of exact concentration. A high degree of purification of the preparation makes it possible to use sprayers of any degree of dispersion. ECOSS-20 BioHumate can be used at different stages of development of agricultural crops.

Scheme of application of the ECOSS-20 BioHumate preparation includes: pre-sowing treatment of seeds together with fungicide or without (preparation consumption 0.2-0.5 l / t, consumption of working solution 10 l / t); preplant treatment of tubers, bulbs, seedlings, cuttings (soaking for 3-24 hours in the working solution 0.002%); spraying on vegetating plants in pure form or in tank mixtures with pesticides and fertilizers (consumption of the preparation 0.2-0.4 l / ha, working solution consumption 0.001% 200-400 l / ha); root top dressing (10 liters of working solution per 5 m^2 or 1 000 l / 500 m^2).

The most effective way of using the preparation is a combination of presowing and non-root treatments.

MATERIALS AND METHODS

To study the effect of "ECOSS" -20 BioHumate on winter wheat of various varieties, a scientific experiment was conducted. To evaluate the impact of "ECOSS" BioHumate the following indicators were taken into account: yield, metric ton/h; increment t/ha (%), an increment from the total area (%), and biometric indicators.

The concentration of preparation used was 250 ml/ha in the full tillering phase and flowering, depending on the variety of winter wheat. The growing scheme for the control was as follows: seed treatment with fungicide, then leaf-feeding dressing together with the herbicide and final leaf-feeding dressing with fungicide. In the experimental group, the seeds were treated first with a fungicide + ECOSS 20 BioHumate – 0.3-0.5 l/t. The second autumn treatment of shoots was during tillering with the purpose of the best development of the root system. The third spring treatment was in the leaf phase together with the herbicide. The fourth treatment – leaf-feeding dressing with fungicide.

The data obtained during the experiment are presented in Table 1.

From the data in Table 1 it follows that the increase in the yield of winter wheat varies from 0.18 to 0.40 t/ha, which indicates the high biological efficiency of the «ECOSS» BioHumate. Similarly, positive results were noted when the preparation was used in all crops studied previously.

Table 1 - Effect of humic preparation of ECOSS-20 on the winter wheat yield of various varieties

Variety	Area, ha	Yield, t/ha	Increment, t/ha (%)	Increment from total area, t	Stage of application
Laureat	32				
Control		4.73			full tillering, leaf-tube formation
Test – ECOSS-20		4.92	+0.19 (0.47)	+6.08	
Grom	42				
Control		5.1			full tillering, leaf-tube for-mation
Test – ECOSS-20		5.30	+0.20 (3.9)	+8.44	
Grom	26				
Control		5.71			full tillering, flowering
Test – ECOSS-20		5.9	+0.19 (0.33)	+4.94	
Yuka	3				
Control		55			full tillering, flowering
Test – ECOSS-20		5.88	+0.38 (0.69)	+11.40	
Bagrat	32				
Control		5.66			full tillering, flowering
Test – ECOSS-20		6.01	+0.35 (0.62)	+11.20	
Brigada	34				
Control		6.23			full tillering, flowering
Test – ECOSS-20		6.60	+0.37 (0.65)	+12.58	
TOTAL	196			+54.64	

Table 2 - Effect of "ECOSS" -20 BioHumate on biometric indicators

Indicator	Control	Experiment - «ECOSS»-20 Bio Humate	Deviations from control,%
Root length, cm	10.3	12.5	+21
Height of the aerial part of the plant, cm	24.3	28.9	+19
Length of plant, cm	34.6	41.4	+20
Weight of biomass of 10 plants, g	11.9	22.6	+90

Often, for farmers there is a situation where, for one reason or another, some of the winter crops are sown at a later date. In such cases, young plants should be helped to form sufficient biomass for a successful overwintering. In connection with this, in the following scientific experiments we studied the effect of ECOSS-20 BiogHumate on the biometric parameters of winter wheat.

Seed treatment with simultaneous treatment during sowing in late terms does not ensure the appearance of good and even sprouts and bushy crops by the winter. The vegetating plants were treated with« ECOSS» BipoHumate at the rate of 250-400 ml/ha.

The preparation was applied at a dose of 250 ml/ha, ground-based, with a working solution rate of 200 l/ha. An evaluation of the stimulating effect was carried out by studying biometric indicators. The result is shown in Table 2.

From the data of the table it follows that «ECOSS»-20 BioHumate at a given dosage and scheme of application has a positive effect on the basic biometric indicators of winter wheat. All the studied parameters in the variant with the use of the preparation were much higher in comparison with the control.

CONCLUSIONS

The technology of production of Biogum "ECOSS", providing a constant chemical composition of the preparation, including biologically active compounds, ensures high growth and development of winter wheat.

REFERENCES

1. Firsov, S.S., Zhigareva, Yu.V., Sukhova, N.V., Efficiency of humic fertilizers in the intensification of winter wheat production processes, *XXI century: results of the past and problems of the present plus* 2017, *5*, 42-49.
2. Kirdey, T.A., Humic preparations in agrotechnologies, *Agriculture* 2013, *5*.
3. Kuzminova, E.V., Antipova, D.V., Zholobova, I.S., Study of biological activity of fodder additive on the basis of humic acid salts in vitro, *Collected scientific works of the Krasnodar Research Centre for Animal husbandry and Veterinary Medicine* 2018, *7(1)*, 280-285.
4. Loginov, L.F., Komissarov, I.D., Influence of humic preparations on growth processes of plants, *Humic preparations. Tyumen agricultural institute. Scientific works* 1971, *14*, 266.
5. Ryabchenko, N.A., Mochalov, V.V., Lisitskaya, S.M., Effect of plant growth regulators on possibility of reduction of insecticide load in agrocenoses of winter wheat, *Biosystems Diversity* 2006, *14(1)*, 160-164.
6. Semenenko, M.P., Zholobova, I.S., Gneush, A.N., Borisenko, V.V., Determination of toxicity parameters of biohumate, in *Materials of the International Scientific and Practical Conference, dedicated to the 70th anniversary of the Krasnodar Scientific Research Veterinary Institute*, Krasnodar 2016, pp. 98-101.
7. Yudina, N.V., Parameters for the evaluation of the biological activity of the organic sapropel substance, *Chem. Vegetative Raw Materials* 1998, *4*.