

P-014 Multifunctional ecologically safe (nano) chips for rice seeds bioencapsulation

Voropaeva N.¹, Yusupov K.², Istomin M., Varlamov V.³, Saimnazarov Yu.²

¹ Russian ac. agricult. sc. State scientific institution All-russian res. Inst. of rape; ² Uzbek sc. Res. Inst. of plant protection, ³ Centre «Bioengineering» RAS
bionanotex_1@mail.ru



INTRODUCTION AND OBJECTIVE

Engineering: from the lab to the manufacture

The state policy in relation to agriculture for today varies aside to ecologation and stimulations of rational biodynamic and organic systems of agriculture.

Development and introduction of ecologically focused systems of an agricultural production, reception of ecologically pure food stuffs are the most perspective directions of development of modern agriculture.

And the most effective and ecologically safe application of plant protection, regulation of growing processes, fertilizers, etc. is possible only at satisfaction of plants requirement in a wide spectrum of the components providing their development without damage to fertility of soil, such as organic fertilizers, biopesticides on the basis of natural raw sources, elicitors, microcells of a feeding, etc.

In connection with the above-stated there is obvious a urgency of the researches directed on development new agro (nano) of technology of preseeding rice seeds by means of ecologically safe physiologically active multifunctional multicomponent (nano) of chips on the basis of modified substances of a natural origin (minerals, polysaccharides and their derivatives) with inclusion of the biopesticides excluding additional loading on ecosystem and promoting to reception ecologically to a net production (Phedorenko F. 2008 ; Ruban I. 2006 ; Osereskovskaya O. 1994 ; Khodjaev S. 2006)

MATERIALS AND METHODS

Developed (nano) chips on the basis of water-soluble polymer (WSP) - natrium salts carboxyl methylcellulose (NaCMC) with elicitor EL Agrohit, Vitavaks and modified vermikulite (MVM) put on a surface of seeds a capsulation method at preseeding processing with formation on their surfaces of an equal, well kept covering (Khodjaev S. 2006).

Preseeding processing of ground in small plot experiences - standard in a facilities : autumn ploughing - on depth up to 25 sm, spring backset - on depth up to 15 sm, disking, harrowing and malonicing. A background of a mineral feed the general in all variants - N₁₈₀P₁₂₀K₁₅₀. Norm of seeding - 190 kg of seeds (5 million number) on hectare. A water mode - flooding.

The agricultural technician of experience - standard in rice cultivating region. As the control the raw seeds served. As the standard used variants of seeds processing by Vitavaks . The area of allotments in small plot experiences makes - 50 m². Experiences are incorporated in 4 replication on skilled fields of UzNIIR.

Seeds of Mustakillik sort are used in the fields. Accounts and spent supervision according to the accepted techniques and the developed instructions (Ruge U. 1955; Dosphehov B. 1983)

Studying of biometric parameters of development of rice in small plot fields experiences (picture 1) has allowed to conclude, that under influence multicomponent multifunctional (nano) chips on the basis of physiologically active substances used in preseeding preparation of seeds, preharvest density of standing of plants and their height were above control parameters.

Values of tillering factor varied over a wide range depending on variants of experience. The highest tillering factor is revealed in variants of experience with processing seeds WSP together with EL and MVM (multicomponent multifunctional (nano) chips on the basis of physiologically active substances - biopesticides).

The greatest length main of brush is noted in variants of experience with processing seeds advanced multicomponent multifunctional (nano) the chip on the basis of physiologically active substance EL together with WSP and MVM.

The greatest weight of grain main of brush has noted been also in a variant of experience with processing seeds same (nano) the chip (WSP together with EL and MVM). In this variant of experience the increase in weight of grain lateral brush in comparison with the control, the standard and other variants of experience is revealed.

Thus the parameter of empty seeds was the least in a variant of experience with processing seeds same multicomponent multifunctional (nano) chips on the basis of physiologically active substances. The weight of 1000 seeds was the greatest in variants of experience with processing seeds WSP, MVM together with EL, and also MVM, WSP together with Vitavaks.



Figure 1. A skilled field of rice

The greatest increase of a crop in relation to the control (14,7 μ /hectares) and the standard (10,8 μ /hectares) is received in a variant of experience at preseeded processing seeds multicomponent multifunctional complex (nano) by the chip on the basis of physiologically active substance EL together with MVM with WSP.

Thus, all studied multicomponent physiologically active multifunctional (nano) the systems intended for preseeded processing of rice seeds, essentially increase productivity of this culture in comparison with the control and the standard and promote decrease in its disease.

The received effects are reached due to joint action of all components developed (nano) chips in the certain combinations and parities. Thus it is necessary to note, that developed of agronanotechnology can provide steady development of manufacture of sowing seeds of rice and other agricultural crops, and also plant growing and agriculture as a whole as in it are used (nano) chips with physiologically active substances of a various spectrum of the action, differing with lability, mobility of structure and properties which can according to soil-climatic and fytosanitary forecasts to vary. Use in structure of (nano) chips of biopesticides allows to receive ecologically safe production, in the long term - "nanoproducts".

CONCLUSIONS

There were developed and approved ecologically safe multifunctional multicomponent complex physiologically active (nano) chips for preseeded processing seeds of rice by means of (nano) technologies by a capsulation method on the basis of a natural mineral - modified vermiculite MVM and means of protection of plants, including the biopesticides received on the basis of processing of a nontoxic natural source of raw materials.

It is revealed, that the greatest increase of a crop of 14,7 μ /hectares in relation to the control (seeds are processed by nothing) and 10,8 μ /hectares - to the standard (seeds are pickled by Vitavaks according to recommendations of firm-manufacturer) is reached at preseeded processing seeds ecologically safe multifunctional multicomponent (nano) by chips on the basis of the modified natural mineral vermiculite MVM with sodium salt carboxymethylcellulose (NaCMC) and elisitor Agrohit by capsulation method .

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