

P-049 Physiologically active (nano) chips for seeds preseeded processing of the soybean by method of capsulation

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INTRODUCTION

Now the question of replacement in a modern agricultural of chemical production means protection of plants is widely discussed by physiologically active nontoxic preparations received from natural raw sources with the purpose of reduction of chemical loadings of ecosystem and reception ecologically of a net production. Their efficiency is studied at processing seeds and crops of various agricultural crops. In particular, numerous researches reveal significant advantages of application in agriculture of chitin, chitozan and their derivatives received from various chitin contained waste. Considering the big interest to manufacture grain-bean of the cultures, connected with reception of production with exclusively valuable food qualities, is spent search and revealing of efficiency of new ecologically safe preparations for processing seeds and plants of a soybean. In particular, advantages of preparations the Narcissus, Chitozar 9-6, Chitozar U, consisting in reduction under their influence of culture disease of a soybean root rot, improvement of some biometric parameters of plants and increase in productivity [1-2] are shown.

The purpose of the given work is perfection of system of plant protection of a soybean with application (nano) technologies of preseeded processing of seeds (nano) the chips including in the structure nontoxic means of protection and regulation of growing processes of plants, and also the substances of a natural origin raising their immune status.

MATERIALS AND METHODS

Realization of object in view is reached due to development (nano) chips on the basis of thin dispersion natural minerals (high porous sorbents-modified of vermiculite), filled by fungicides, possessing by the certain type of activity (Topsin M), substances (Agrochit), raising the immune status of plants (elitors), adjusting their growth, development and providing increase of adaptability of plants to negative factors of an environment and their application at preseeded processing seeds of a soybean by capsulation method.

Developed (nano) chips of various structure on the basis of water-soluble polymer-sodium salts of cellulose glicollic acid with elisor AgroChit, Topsin-M and modified by vermiculite put to the seeds with formation

on their surfaces of an equal, well kept covering. Preseeded processing of ground in small plot experiences - standard in the farms: fall ploughing - on depth up to 25 sm, spring ploughing - on depth up to 15 sm, disking, harrowing and maloning.

A background of a mineral feed the general in all variants - P₆₀K₉₀. As phosphoric fertilizers used ammophos or concentrated superphosphate, potash fertilizers - chloride potassium. Phosphoric and potash fertilizers have been brought before crop (100 % of P, 50 % K from annual norm). The others of 50 % of potash fertilizers - during the beginning of flowering according to Recommendations on cultivation of leguminous cultures. Norm of seeding - 60-70 kg/he of selected seeds of a soybean. An irrigation - 5 irrigation in the vegetative period. The area of allotments in small plots experiences makes 100 m². Experiences are incorporated in 4 frequency on skilled fields of Uzbek rice research institute. Accounts and supervision spent according to the accepted techniques and the developed instructions.

RESULTS AND DISCUSSION

As a result of the lead researches in field small plots experiences it has been established, that in all variants where seeds of a soybean are processed developed (nano) systems by capsulation method consisting from sodium salts of cellulose glicollic acid modified by vermiculite and AgroChit; sodium salts of cellulose glicollic acid together with AgroChit, terms of the beginning of occurrence of shoots have coincided with terms in a control variant.

In a reference variant (seeds are processed by Topsin-M in the quantity recommended by firm-manufacturer), the advancing of occurrence of shoots in comparison with the control over two days was observed.

The height of plants defined in various terms of accounts, had complex dynamics and changed depending on structures (nano) systems for processing seeds. The quantity of leaves on plants of a soybean at the first account varied over a wide range depending on structure (nano) chips. The greatest quantity of leaves has noted been in variants of experience in which seeds have been processed (nano) by the chips including sodium salts of cellulose glicollic acid, modified by vermiculite,

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AgroChit; sodium salts of cellulose glicollic acid and AgroChit.

Introduction in system of recommended norm of Topsin-M promoted appreciable decrease in number of leaves on a plant. The analysis of dynamics of occurrence of leaves at the subsequent accounts testifies to the same revealed laws. Besides influence developed multifunctional (нано) systems with AgroChit has been revealed at preseeded processing seeds on quantity of flowers of a soybean.

At the first account it was revealed, that in all variants of experience except for a variant where seeds have been processed Topsin-M (standard), the increase in quantity of flowers in comparison with a control variant of experience was marked. In the subsequent accounts revealed before correlation between structures (nano) chips and quantity of flowers were kept. The quantity of flowers changed from 54,7 in the control up to 65,7 - in skilled variants. Developed multicomponent multifunctional (nano) chips rendered essential influence on quantity of branches of plants of a soybean.

In all variants of experience (processing of seeds sodium salts of cellulose glicollic acid together with AgroChit and modified by vermiculite, and also sodium salts of cellulose glicollic acid together with AgroChit) this parameter exceeded control values and changed from 0,5 pieces in the control up to 1,8 pieces - in experience. The greatest quantity of the generated beans on plants of a soybean at the initial stages of fruit formation was marked in all variants of experience in comparison with the control over the standard where seeds were processed by Topsin-M.

At the subsequent accounts variants of experience where seeds were processed sodium salts of cellulose glicollic acid with AgroChit also were effective; sodium salts of cellulose glicollic acid together with modified by vermiculite and AgroChit. Use of full norm by Topsin-M in structure of multifunctional (nano) systems led to some suppression of process of formation of beans.

In the further we had been studied influence (nano) systems for preseeded processing seeds of culture of a soybean by capsulation method on height of plants (plants are selected after end of the period of vegetation), height of plants up to the first bean, quantity of branches and beans, and also quantity of a crop.

As a result of the lead researches it has been shown, that processing of seeds of a soybean (nano) by the chips consisting from sodium salts of cellulose glicollic acid with AgroChit, promoted increase in height of the plants selected after end of the period of vegetation of culture of a soybean.

The height of plants up to 1 bean changed from 17,7sm in the control up to 22,1 sm - in experience. Obtained data on increase in height of plants up to 1 bean in the variants of experience specified above are extremely important at the mechanized harvesting a soybean. The quantity of

branches of plants of a soybean varied from 0,9 pieces in the control up to 1,8 pieces in experience. The quantity of beans in the majority of variants of experience exceeded control values and changed depending on structures developed (nano) systems for preseeded processing seeds from 79,2 pieces up to 87,6 pieces. The weight of 1000 seeds depending on structure developed (nano) systems changed from 148,1g in the standard up to 170,1g- in experience. The analysis of productivity of culture of a soybean also testifies to efficiency of some developed (nano) systems for processing seeds of culture of a soybean.

Thus, despite of received complex dynamics of growth and development of plants of a soya depending on structure developed multifunctional physiologically active (nano) systems, it was possible to reveal the most effective developed (nano) systems for preseeded preparation of seeds by a method of bioencapsulation. Finally, application of these systems in technology of preseeded preparation of seeds has provided achievement high field germination, promoted increase in quantity of branches and leaves, quantity of beans and productivity of culture of a soybean.

CONCLUSIONS

Thus the increase in the productivity caused by use (nano) of systems for preseeded processing of seeds of a soybean, has made in separate variants of experience from 0,6 c/he up to 15,0 c/he depending on structure and concentration of used components in the developed multifunctional systems. Thus it is necessary to note that the highest productivity has been reached owing to increase in weight of seeds of a soybean. In the practical plan that some of the developed systems promoted increase in length of a stalk up to the first bean is important. In ecological aspect the opportunity of use in developed (nano) systems of ecologically safe derivatives of chitozan is essential, that reduces additional chemical loadings on ecosystem and allows to receive ecologically clean production.

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