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Impact of Adoption of Rhizobium Preparations on Efficiency of Soybean in a Zone of an Unreliable Moistening.

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ABSTRACT

The paper examines the impact to treatment of soybean seed by bacterial preparations containing in its composition of bacteria of the genus Rhizobium for nitrogen-fixing activity and soybean yields in a zone of an unreliable moistening.

Keywords: Rhizobium preparations, soy, experience version nitrogen-fixing activity, productivity.

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INTRODUCTION

Nutrition is a determining factor in the health of the state's population. The protein is of universal significance and is the basis of virtually all processes of the organic world. In a rational human nutrition, he has a special place [11, 13, 15].

Due to the significant increase in world population and the increased need for protein in world, agriculture has been a steady tendency to increase production of protein food sources. Of the total world protein resources of the late twentieth century, in different regions of humanity receives for food purposes 68-70% vegetable protein, and only 30-32% - animal origin. Vegetable protein and mainly serves as a primary source of global resources of the protein used for food and feed purposes [5, 8, 12].

Today, soy - one of the most important food crop in the world. Great practical interest in soybeans because its seeds contain up to 50% protein and 20-23% vegetable oil.

Most soybean plants needs nitrogen, which confirmed by a large number of researchers and this is due, above all, a high protein contents in the soybean seeds. To satisfy this need by mineral nitrogen during for all phases of development is impossible [6, 7, 9, 10, 17].

Many authors have noted that the most efficient and cost-effective options by a bacterial inoculation of seeds fertilizers [1; 2; 3; 4].

MATERIALS AND METHODS

In the Central Caucasus, at the experimental station SSAU and Armavir Experimental Station of All-Russian Research Institute of oilseeds conducted a study on the effectiveness of Rhizobium preparations and technologies for their use in the preliminary treatment of soybean seeds (seed treatment bacterial preparations together with adhesives). The experiments studied drugs: Nitrofiks P - dry inoculant based on gamma-sterilized peat, which contains nitrogen-fixing bacteria - Bradyrhizobium japonicum and Bradyrhizobium elkanii., F- Nitrofiks liquid inoculant based on the stabilized gel substrate that contains a nitrogen-fixing bacterium Bradyrhizobium japonicumi, inoculant Optimayz - Active substance: lipo-chitooligosaccharides + Rhizobium Leguminosarum, Noktin A - a special liquid inoculant based on a strain of nitrogen-fixing bacteria soybean Bradyrhizobium japonicum E109 [14, 16, 18].

Preceded in experiments - winter wheat, four repetition of experience, placement options - randomization. Seeding mechanized, performed drills HRC-6, soybeans and Vilan Duniza. The total area of the plot - 44.1 m^2, the discount - 29,4 m^2. The experiments were conducting in accordance with their requirements.

RESULTS AND DISCUSSION

It was founding that treatment of soybean seeds with bacterial fertilizers (Table 1) contributed to obtaining the highest soybean yield. The highest yield of soybean varieties Vilana obtained in variants with drug Nitrofis P together with adhesive containing in its composition, not only bacteria, but also trace elements (technology KPIS) - 2.48 t / ha. In embodiments where the seeds were treated with preparations A and Optimayz Noktin, the yield was higher compared to the control one 0.14 - 0.21 t / ha. Research in the conditions of Armavir Experimental Station (Table 2) also indicates the positive effect of bacterial preparations.

The study of bacterial fertilizers used for processing soybean seeds showed that the Agriculture promotes yield increase of soybean varieties with diameter between 0.1 and 0.2 t / ha. In embodiments using a film-forming - Technology KPIS Adyugreyn and it was awarded the highest gain, and it was on average over three years of research 0.17 - 0.20 t / ha.

CONCLUSION

The results indicate that the use of film-forming seed treatment promotes bacterial preparations yield increase in these cases, an average of 4.2 -12.5%.

It was founding that the methods used to increase the ability of the root system of plants to absorb nitrogen from the soil, activating the photosynthetic activity that enhances the outflow of nitrogen compounds from vegetative organs to seed. In this regard, along with increased crop seed treatment before sowing rhizobium drugs helps improve the quality of soybean seeds. It should be noted that the protein content in soybean seeds on embodiments using bacterial preparations, as compared to untreated seeds, increased by 0.4 - 1.2%.

Table 1: Influence of preplan treatment on yield and seed quality of soybean cultivar Villain (Experimental Station SSAU), 2008-2009.

Option	Productivity, t/he	Content %		Collectionprotein t/he
		Protein	Oils	
Control (notreatment)	2,06	38,2	22,3	0,71
Nitrofiks n 2 l / t	2,34	38,6	22,4	0,81
Nitrofiks P, 2 kg / m + film former (KPIS)	2,48	39,4	22,5	0,88
Nitrofiks F, 2L / t	2,46	39,3	22,4	0,87
Noktin A 3 l / t	2,20	38,9	22,5	0,77
Optimayz, 2,8l / tonne	2,27	39,0	22,2	0,79
NSR0	0,16			

Table 2: Influence of preplan treatment on yield and seed quality of soybean cultivar Duniza (FGBNU «VNIIMK AOC»), 2013 - 2014.

Option	Productivity, t/he	Content %		Collectionprotein t/he
		Protein	Oils	
Control (notreatment)	1,59	39,8	20,4	0,56
Nitrofiks n - 2 kg / m	1,70	40,2	20,6	0,62
Nitrofiks F - 2.5 l / t	1,69	40,3	20,5	0,61
Nitrofiks P - 2 kg / t + seed film former (KPIS)	1,79	40,3	20,0	0,65
Nitrofiks P - 1.5 kg / t + seed film former (KPIS)	1,73	40,4	20,6	0,63
Nitrofiks F - 2.5 l / t + seed film former (adyugreyn) - 1 l / t seeds	1,76	40,5	20,4	0,64
NSR05	0,17			

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