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Influence Of Biohumax And Biotor S Preparations On Beet Seminal Micoflora And Beet Crop Rotation

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Abstract

The examination is conducted in 2015, at „in vitro" conditions. The semical micoflora is analyzed and % „germs slaughtered" of 4 samples seeds of maize, sorghum, sugar beet and fodder beet, treated with two bio-preparations - fertilizer for leaf and seeds treatment – Biohumax and Biotor S. Biohumax and Biotor S preparations activate species *Mucor , Penicillium and Fusarium* from the composition of seed micoflora in maize, sorghum, sugar beet and fodder beet. Applied for maize seeds treatment, Biohumax and Biotor S preparations increase the quantity slaughtering germs.

Key words: *beet, maize, sorghum, Biohumax, BiotorS*

Introduction

The use of biologically active substances, bioproducts and organic fertilizers in modern farming is an alternative to high doses of mineral fertilizers and pesticides that violate the ecological balance in agrobiocenosis (Kurdyukov, 1982; Gushin et al., 1996). The inclusion of organic products in agricultural technologies reflects favorably on development, productivity and stress resistance of crops. In this regard are indicative studies of several authors as regards the effects of physiologically active substances, fertilizes and bio-pesticides, applied to the treatment of the seed and through vegetation of vegetables (tomato, pepper, cucumber), some crops (such as maize, sunflower, legumes) and sugar beet (Hristova et al. 1994; Podluscki et al, 2002; Sapronov et al., 2002). In our country mechanisms of organic products, local production - suspension fertilizers Laktofol are studied. Some studies on the effects of the preparations Laktofol on growth, development and productivity of various crops are made (Rankov et al., 1992; Sapundjieva et al, 1996). Improve the productivity and quality under the influence of bioproducts of tomatoes, peppers and cucumbers has been found.

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Studies of many authors establish active interference of bio-preparations in crops metabolism, damaged by prolonged use of pesticides. It is expressed in increasing the general plants life and improve their resistance to stress factors including and against phytopathogens (Kustova et al., 1978; Kudyukov, 1982).

Stancheva and others (1999), examine the effect of bio fertilizers Laktofol на биоторовете on seed portable pathogens some vegetable crops. They found that treatment of seeds of peppers and tomatoes with Laktofol does not affect species of *Alternaria*, but reduces the amount of fungi of the genus *Fusarium* and *Penicillium*. The purpose of this study is to investigate the effects of organic fertilizers Biohumaks and Biotor S, used as preparations for seed treatment on seed micoflora of sugar beet, fodder beet, wheat and maize.

Material and method

The examinations are conducted in Shumen University - the city of Shumen, at in vitro conditions, in 2015. The seeds of wheat, maize, sugar and fodder beet are treated with fertilizers Biohumax and Biotor S, as having met the manufacturer's instruction.

Biohumax preparation is a product of Projest Studio Ltd.- city of Varna and it represents an aqueous extract of Worm compost from Red Californian worm, in order to avoid inconveniences and problems for farmers under the direct administration of Worm compost. It contains humate, humic acid, a complex of amino acids, antibiotic substances. It is recommended for treatment of seeds of grain and other crops, for the foliar feeding in vegetation and soil treatment after sowing (http://www.biohumax.eu/ingredien). For the aims of the study Biohumax is applied in a concentration of 2% with a norm 40ml/1kg seeds.

Biotor S preparation is a product of Bea Biotor Company, which is a form of merger of two international companies - Bea Organic Tarim Urunleri with headquerters in the city of Bursa / Turkey with a directions to the markets of Turkey and Arab countries and Bea Almalak Ltd company, with headquarters in the city of Sliven / Bulgaria with a direction to Bulgarian and European markets. Biotor S is a liquid organic fertilizer from California red worms, is is obtained after the application of modern biotechnology. It is an ecological humic fertilizer with a wide range of applications in all crops grown in open areas and in greenhouses. For the purposes of

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the study Biotor S is applied, diluted with water in the ratio of 1:150 as the seeds are soaked in the solution for 4-6 hours, then dried (http://beabiotor.com/prod.html).

Experimental setup for seminal micoflora isolation

Treated seeds are transferred on a solid media – potato-dextrose agar (PDA). The nutrient medium is dispensed into sterile Petri dishes (with a diameter 9 cm), in the amount of 30ml / l, and in each dish 10 pieces. Each option is in 5 repetitions and contains 250 pieces of the seed crop. The cultures were grown in the dark at 23-24^0 C. On the 7^{-the} day of cultivation the type and number of colonies formed are determined (Popkova, 1987).

Identification of seminal micoflora

On the 7th day of incubation of seeds, parts of the growing mycelium from micelle colonies is transferred onto acidified potato-glucose agar to obtain pure cultures. After 7 day period microscopic analysis for the determination of tribal affiliation of pure cultures using a turnkey qualifiers (Barnett and H (Barnett and Hund,2003; Booth, 1972; Subramanian,1971).

The frequency of occurrence of isolated species in the associated micoflora is reported in %, ine formula:

$F= A_I \times 100/A_t$, where : F- Frequency in % ; A_I- Number infected seeds with the respective genus; A_t- Total number of seeds in the sample. The results obtained are treated statistically by variation analysis for quality signs.

The relative number of colonies (relative presence) of each isolated from associated micoflora genus is reported in % by the formula:

$A = A_{GI} \times 100 / A_{TI}$, where: A- Relative presence in %; A_{GI} – Number seeds infected by the respective genus fungi; A_{TI} – Total number infected seeds.

The influence of preparations on germs “slaughtering” is established by taking into account % slaughtered germs on the 14th day of cultivation (Popkova, 1987).

Results and discussion

The results of reporting the treated seeds micoflora in cultures are given in Table 1.

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Table 1
Effect of Biolife and Biotor S preparations on seed crops micoflora

Cultures	Asper-gillus ssp	Alter-naria ssp	Mucor ssp	Peni-cillium ssp	Fusa-rium ssp
Sorghum					
Not treated seeds	-	+	++	+	+
Biotor S 1: 150	-	++	++	+++	+
Biohumax – 2%	-	+	+++	++	++
Maize					
Not treated seeds	-	+	++	+	++
Biotor S 1:150	-	+++	+++	++	+++
Biohumax – 2%	-	+	+++	++	++
Sugar beet					
Not treated seeds	+	++	+	+	-
Biotor S 1: 150	++	+++	+++	+++	-
Biohumax – 2%	+	++	+++	++	-
Fodder beet					
Not treated seeds	-	+++	++	+	+
Biotor S 1:150	-	++	++	++	++
Biohumax – 2%	-	+++	+++	++	+

Legend: +++ to 50% – frequency of occurrence in option
++ to 25 % - frequency of occurrence in option
+ to 15% - frequency of occurrence in option
0 it is not found

Treatment of seeds with Biohimax does not affect the development of species of *Alternaria* genus, but is favours the development of the types molds of *Mucor* and *Penicillium* genera, regardless of culture. Species of *Mucor* genus reach to 100% presence in options. Treatment of wheat seeds with Biohumax causes increasing the quantity colonies of *Fusarium* genus to 25% (Table1). The treatment of seeds with Biohumax does not cause inhibition of seminal micoflora.

The application of Biotor S for seeds treatment fodder beet has a suppressive effect of *Alternaria* species. In other cultures application of Biotor S as a means of treatment the seeds has the opposite effect as regard *Alternaria* species. This effect is most indicative of maize seeds – up to 100% presence in options.

Seeds treatment with Biotor S strengthens development of *Mucor* , *Penicillium, Fusarium* species.(Table1).

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Table 2 shows the results of impact of studied preparations on germs "slaughtering".

Table 2
Impact of Biotor S and Biohumax preparations on germs "slaughtering" in field crops

Options	Sorghum		Maize		Sugar beet		Fodder beet	
	Slaughtered germs pieces	Relative %	Slaughtered germs pieces	Relative %	Slaughtered germs pieces	Relative. %	Slaughtered germs pieces	Relative %
Not-treated seeds	60	100	66	100	83	100	80	100
Biotor S 1:150	54	103.4	84	127.8	83	100	84	105.2
Biohumax 2%	53	101.7	77	116.9	80	96.9	80	99.7
GD – 5 %	**4.72**	**8.9**	**3.14**	**4.7**	**3.97**	**4.8**	**2.68**	**3.3**
GD – 1 %	**6.78**	**12.8**	**4.51**	**6.8**	**5.70**	**6.8**	**3.85**	**4.8**
GD – 0.1 %	**9.97**	**18.8**	**6.64**	**10.0**	**8.38**	**10.1**	**5.66**	**7.0**
P - %		**2.76**		**1.27**		**1.50**		**1.02**

In wheat no impact is observed on Biohumax and Biotor S fertilizers on germs „slaughtering". Treating seeds with studies fertilizers in maize increases the quantity slaughtered germs most highly in option with Biotor S. Slaughtered germ in this option are with 27,8% more compared to the control (Table 2). At the same culture lowest is the negative impact of Biohumax, where the quantity slaughtered germs increases by 16,9%.

In sugar beet there is a tendency to reduce germs „slaughtering" in seeds treatment with Biohumax Biotor S. Increased concentration of Biolife causes germs "slaughtering" to the level of control. Treatment the fodder beet seeds with Biotor S increases the slaughtered germs with 5,2%. Treatment with Biohumax established a tendency to backfire (Table 2). In view the results obtained of the research the following conclusions are made:

Conclusions:

- Biohumax and Biotor S preparations activate *Mucor, Penicillium* and *Fusarium* species on the composition of seminal micoflora in maize, sorghum, sugar beet and fodder beet.

- Applied for treatment of maize seeds, Biohumax and Biotor S preparations increase the quantity slaughtered germs.

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