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Studies of Resistance of Wheat Varieties against Fusarium Disease: As an example of Karakalpakistan Republic

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Abstract

The article deals with the studies of resistance levels of 13 varieties of regionated and 12 types of local wheat against the fusarium disease in the condition of Karakalpakistan region. The disease was estimated in 5 pointed scale. The resistance of wheat sorts against the fusarium disease was determined through the quantity of separated fungi types which belong to Fusarium family. Totally the following fungi types which belong to Fusarium family were separated from wheat: F.oxysporum. F.graminearum, F.soloni, F.javanicum, F.heterorsopum, F.verticilloides, F.avenacium, F.culmorum, F.sambucinum

Keywords: *Wheat Varieties etc.*

Introduction

The fusarium disease is widely spread in the condition of Karakalpakistan Republic and they appear as in the cases of root wilt, fusarium decay and ear fusarium. However, the resistance of existing sorts have not been studied at all.

The fertility and product quality depend on the features of planted varieties. It could be increased to 30-50% according to correct selected variety. Achievments in this sphere can prolong the products` provision of population, reduce the expences of transportation, providing the industry with quality row materials and increase the annual quanity of harvest.

In the condition of Russia information about varieties show that [6,7]: " Variety and hybrid" – are the basis of high yield.

The present demand from the varieties are creating disease resistant and high yield types and the creation of varieties which are apropriate for long term storaging and reprocessing.

The objects and methods of investigation

There are less varieties of cereal crops resistant to fusarium disease, but there could be observed differences between them according to resistance to this desease. The level of resistance of varieties mostly belong to their stability to environmental conditions and genetic features of plant. Less resistance varieties are characterized with less stability to above mentioned factors. [1].

Thus, for creation of high quality crop selection should concentrate on creating varieties with the features of resistance for many components, it creates the favourable condition for adopting biotic and abiotic factors.

The investigation object is 14 varieties brought from Russia and 11 local wheat types and their resistance against fusarium disease in Karakalpakistan experimental station of Scientific Research Institute of Cereal crops.

Observed wheat varieties were planted in 10м^2 area in Karakalpakistan experimental station of Scientific Research Institute of Cereal crops. Their infected level marked in the periods of sowing, germination period, appearing stem and appearing ears.

It was taken 3 examples from every stem, and analysed their root, stem, leaf, crop through the micological analyses. [2,3,4,5].

According to the vertical resistance of infection level with fusarium disease in the condition of Karakalpakistan Republic taking into consideration of growing procedures first of all root system, then stem, after leaf and at last ear bearing, intensivity and resistance varieties estimated in 5 scale.

0 scaled-plant`s root, stem and on leaf infection is not observed.

I scaled – plant`s root point decays changing into black colour and yield reduces to 2-3 C/ha.

II scaled –plant`s stem gets thiner, joints and joint`s interval changes into black colour. Yield reduces to 4-6 c/ha.

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III scaled – plant`s water balance destroyed, observed the wilt signs on leaf and they changes into yellow. Yield reduces to 7-9 c/ha.

IV scaled – plants slow from growing, and do not unite, ears make colourless and small crop. Yield reduces to 10c/ha.

Results of investigation

The poligen resistance depending on biotic and abiotic factors varieties whicha are planted in the condition of karakalpakistan Republic need genetic, selection, embrional, anatomic, morphologic researches.

The results of resistance of varieties against the fusarium wilt observed in different periods of vegetation in the condition of karakalpakistan Republic andgeneral information of their poligen resistance is given in the table 1.

Table I Poligen resistance

Numeration	Names of varieties	Disease level in points.				
		0	I	II	III	IV
Varieties brought from Russia						
1	Irishka					+
2	Gratsiya		+			
3	Lastochka			+		
4	Kralya				+	
5	Liga-1					+
6	Aybina					+
7	Moscwich				+	
8	Grom			+		
9	Vershina					+
10	Kalim			+		
11	Yuka					+
12	Zimorodoc					+
13	Moscowskaya-56					+
Local varieties						
1	Ustoz		+			
2	Davr					+
3	Start			+		
4	Nihol				+	
5	Durdona		+			
6	Humo		+			
7	Vodiy		+			
8	Iftihor			+		
9	Sanam			+		
10	Krass-Andijan			+		
	Zamin			+		
11	Garezsizlik		+			

According to the results on the table it is seen that, local sorts and the sorts brought from russia show difference in polegen resistance in the condition of Karakalpakistan Republic.

In the condition of Karakalpakistan Republic not a single variety brought from russia show full immune feature against the fusarium disease.

There were not observed fusarium free sort among the investigated ones. During the research period depending on investigated soil condition from early germination till harvesting period in the various phases of vegetation fusarium appeared in various intensivity. The infecting types did not depend on the varieties` resistance but pathogen`s agressivity and the soil`s ecologic condition.

Unresistance in regionated varieties of wheat against the fusarium disease, could be explained by not taking into consideration immune features against this disease during the selection period. Moreover, in the investigations where selectioners did not pay attention to opening their genetic mechanizm.

In the condition of Karakalpakistan soil regionated varieties as Garezsizlik, Yonbosh, Yaksart, Grom, Amudaryo found as more resistant against fusarium disease. Although these varieties show disease signs variously, after whole vegetation period the yeild is reduced only to 2-6 c/ha.

The varieties Grom, krasnodar 99, tanya, kroshka, Moskowskaya 56, zamin, Davr, Zimorodok, Ayvina, vershina, YUKA, KA-9, Liga, irishka in the northern regions of karakalpakistan belong to varieties with the higher risk to fusarium disease. Even though these varieties show rapid vegetation during the period of union sharply slow down. Leaves on the lower parts of plant change into yellowish colour and half part get wilt. Though they bear 2-3 ears, the length of ears reduces and crop becomes

smaller size. The yield in such varieties reduce till 10 c/ha. These varieties influences on increasing the most agressive types of fungies in soil and reduces the number of propogulas. For this reason the territory of varieties which infected with agressive types of fusarium consist of 5-10-15m^2.

Table 2 demonstrates the information about fito expertise of herbarium which were gethered in varios levels of infected plants.

Table 2 Fusarium fungi types separated from infected wheat varieties in various level

Num.	Names of varieties	Fungi types which belong to *Fusarium* family.									Types of varieties
		F.oxysporum.	***F.graminearum***	***F.soloni***	***F.javanicum***	***F.heterorsopum***	***F.verticilloides***	***F.avenacium***	***F.culmorum***	***F.sambucinum***	
Varieties brought from Russia											
1.	Irishka	+	+		+		+	+	+		**6**
2.	Gratsiya	+									**1**
3.	Lastochka	+		+		+		+		+	**5**
4.	Kralya	+			+		+				**3**
5.	Liga-1	+			+	+		+	+		**5**
6.	Aybina	+		+	+		+		+		**5**
7.	Moscwich	+	+								**2**
8.	Grom	+		+			+		+		**4**
9.	Vershina	+	+			+		+			**4**
10.	Kalim			+			+			+	**3**
11.	Yuka	+		+	+	+		+			**5**
12.	Zimorodok			+		+	+	+			**4**
13.	Moscowskaya-56		+	+	+		+			+	**5**
Local sorts											
14.	Ustoz		+								**1**
15.	Davr	+	+					+		+	**4**
16.	Start			+	+						**2**
17.	Nihol		+		+	+					**3**
18.	Durdona	+	+								**2**
19.	Khumo		+			+					**2**
20.	Vodiy	+	+								**2**
21.	Iftihor		+	+			+				**3**
22.	sanam	+		+		+					**3**
23.	Krass-Andijan		+	+							
24.	Zamin			+		+		+		+	**4**
25.	Garezsizlik		+								**1**

During the resistance researches of the all varieties against the fusarium disease in the condition of Karakalpakistan Republic it was investigated that all local varieties were more resistant. The reason for high resistance of varieties created in local conditions against the Fusarium wilt, is the natural immune aqquired against not only for ecologic factors but also against the local members of micobiota. The reason for low infection level of wheat varieties as Garezsizlik and Amudaryo, is the participatio of basic types as *F.oxysporum*, *F.graminearum*, *F.solani*. It means in infectionation of local varieties participates only 2-3 types of *Fusarium* fungi.

Besides the types which were brought from abroad in infectionation participates the types as: *F.javanicum, F.heterosporum, F.verticilloides, F.avenaceum, F.culmorum, F.sambucinum.* Results show Krasnodar 99, tanya Elita varieties show 4, Lastochka, tanya, Moskowskaya-56 varieties show 5, Kroshka variety show 6 Fusarium types participation and increasing of pathogen level in the foreign sorts and their low immune features.

The most important thing is fusarium fungi types as *F.oxysporum*, *F.graminearum*, *F.solani* determined as the most agressive types among others.

This shows that rotatory sowing cotton and wheat influences on creating new types of fungies within the

union of cotton and wheat fusarium fungies and the dominant types of fugies in the soil.

Conclusions

Thus, In the saline soil condition of Karakalpakistan Republic the following varieties are appropriate for planting: Yaksart, Yonbosh, Sanam, Iftihor, Krolya, Nihol, Khumo, Moskwich, Start, Vodiy, Amudaryo, Garezsizlik, Tany Elita.

The high infected results were seen on the varieties as: Grom, Krasnodar 99, Tanya, Kroshka, Alvina, Yuka, Liga-1, Irishka, KA-9, Vershina, Zamin, Davr, Moscowskaya 56.

On the plants which strongly infetcted with Fusarium wilt the participation of compex types of Fusarium wilt become reason for clear demonstration of disease signs.

For this reason, creation of new varieties should be based on immune of varieties resistant to fusarium wilt.

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