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"BO" IONOMER IMPORTANCE IN SOIL IRRIGATIVE EROSION CONTROL

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ABSTRACT

It was determined that, during the research "BO" ionomer enhanced a quantity of the soils waters Table aggregates. Though a quantity of aggregates in bright–grey-brown soils was 18.30%, when 30 kg of solution was applied per hectare, it was 19,0%, 22,10% in 50 kg, 24,5% in 100 kg. The analogical results have been obtained in meadow-grey soils. The bottom leaching speed of flow in bright grey-brown soils was ranging from 0,051 m/sec to 0,070 m/sec, but in meadow-grey soils it was from 0,045 m/sec. to 0,060 m/sec. As a result of irrigation it is possible to prevent soils from irrigative erosion to a possible limit in enhancement of water expenditure quantity.

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INTRODUCTION

Introduction the soil structure is one of the main factors in the fertility and development of agricultural plants. Availability of good water-air and heat regimes of structural soils brings to the development and productivity increase of the plants. When quantity of waters Table aggregates is little in the soil structure, their degradation occurs very quickly because of the development of erosion process more intensively. Decreasing of water sTable aggregates quantity in the irrigative soils causes reduce of roughness, a speed of the leaching flow becomes weak. Some researches approve role of polymer (Kagramanova, 2012; Kuznetsov, 1981; Pogoyansk, 1982; Nosadze, 2014)

Study: The researches were carried out in meadow – grey and bright grey-brown soils of the Kur-Araz Lowland.

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They were performed under "BO" ionomer splashing taken as a solution 30 kg, 50 kg and 100 kg per hectare. WatersTable quantity of the soils was studied by N.Savvinov's method (Kuznetsov, 1993): But "BO" ionomer stability of soils against erosion was defined by the following formula presented with the bottom leaching speed of flow (Kuznetsov, 1993):

$$V_{\Delta p} = 1{,}55\sqrt{\frac{g}{\gamma_0 \cdot n} d(\gamma - \gamma_0)(1 - \frac{P}{100})}$$

Here g – is gravitation force; m/s^2; n-a coefficient for characterizing flow speed; (n =2,28); d – means diameter of water sTable aggregates; m; γ-γ_0 – accordingly a special mass of soil and water, g/sm^3; P- is porosity %, but means diameter of water sTable aggregates:

$$d = \frac{d_1P_1 + d_2P_{2+\cdots+} d_nP_n}{100}$$

Here d_1, $d_2 \ldots d_n$ are diameters of watersTable aggregates over ractions P_1, $P_2 \ldots P_n$ -are quantities of watersTable fractions by a percentage.

Table 1. Effect of "BO" ionomer on waters table structure of soil

N	Name of soil	Quantity of BO ionomer kg/hec.	Quantity of water stable aggregates		
			>1,00	1-0,25	>0,25mm
1	Light grey brown	0	18,30	14,20	40,50
		30	19,00	28,10	47,10
		50	22,10	26,80	48,90
		100	24,50	27,20	51,70
2	Meadow – grey	0	12,70	22.00	34,70
		30	17,40	23,50	40,90
		50	18,90	24,10	43,00
		100	23,20	23,30	40,50

Table 2. Effect of "BO" ionomer erosion stability on flow bottom leaching speed of soil erosion

N	Inclination	Soil name	Quantity of applied "BO" ionomer kg/hec.	Bottom leaching speed of flow, m/sec
1	0,021	Bright grey-brown	0	0,051
			30	0,056
			50	0,064
			100	0,070
2	0,016	Meadow – grey	0	0,045
			30	0,053
			50	0,058
			100	0,062

Table 3. "BO" influences on leaching of humus, nitrogen and phosphorus from soil during irrigation (water consumption – 0,31 l/sec)

N	Inclination	Soil name	Quantity of applied "BO" ionomer, kg/hec.	Leaching quantity		
				Humus kg/hec.	Nitrogen kg/hec.	Phosphorus kg/hec.
1	0,021	Bright grey-brown	0	228,8	31,8	45,0
			30	109,2	7,6	24,0
			50	72,9	5,1	16,8
			100	33,6	2,6	5,9
2	0,016	Meadow – grey	0	217,5	18,0	35,5
			30	126,3	8,8	27,8
			50	64,2	4,6	15,0
			100	30,9	2,5	4,7

The water expenditure was determined by Thomson (45`) water spillway. Quantity of leaching soil was calculated according to dependent materials flow, of taken water samples. Humus, nitrogen and phosphorus quantity have been determined in soil and dependent materials by the obtained methods.

DISCUSSION

K-4 and K-9 polymers produced in Tashkent, in former Soviet Union are irreplaceable chemical radical means in enhancement of fertility and productivity in formation of soil durability against erosion. These polymers were used and are used in the irrigative soils of the south regions. Use of the polymers as a control measure against irrigation and wind erosion is approved to be important (Suleymanov, 2003; Nosadze, 2014). It has been shown that, a quantity of watersTable aggregates gets increased till 50-20 times in 2 sm soil layer while splashing of K-4 and K-9 polymer solution on soil surface (Suleymanov, 2003; Vasilyev *et al*., 2011). M.S. Kuznetsov and Bazarov (Pogoyansk, 1982) determined that a speed of bottom flow leaching gets increased as a result of application of 20 kg K-4 polymer solution per hectare. Though leaching speed of bottom flow was 0,05m/sec in the furrows where polymer solution wasn't applied, with the use of 20 kg solution it was 0,20 m/sec. in the furrows. As "BO", "L" and Latax chemical substances like K-4 and K-9 polymers are produced. "BO" possesses an abrasive character of gluing the soil particles to each other.

At this time the waters Table aggregates quantity enhances, an ability of soils to absorb water gets increased. "BO" ionomer is a reason for evaporation weakening in soil. This is very important in arid climate condition in irrigative soils (Pakhomov, 2016; Rakhmanov *et al*., 2017). "BO" ionomer is produced in EIB in Baku. There is no danger for the environment and living beings (Kagramanova, 2012). "BO" ionomer is a reason for an equal humidity in the soils and therefore humid supply is stabilized. Its main parameter is enhancement of erosion stability and minimizing a quantity of leached soil mass. N.R. Suleymanov (Vasilyev *et al*., 2011) shows an importance of structure formation by "BO" ionomer in the salinized soils. Aqueous solution of "BO" ionomer was used during the research. The solution was splashed on soil surface to a different degree due to versions. As a control version the variant without solution application was taken. In light-grey brown soils where ionomer wasn't used, a quantity of aggregates greater than 1 mm was 18,30%. When 30 kg solution was splashed per hectare it was 19,00%, in 50 kg version – 22,10%, in 100 kg version – 24,5-%. The same results have been obtained in meadow-grey soils (Table 1). "BO" ionomer influences the stability of soils against erosion. So, though bottom leaching speed of flow is 0,051 m/sec. in the bright grey-brown soils, this is 0,056 m/sec. in the version where 30 kg solution was applied per hectare, it was 0,064 m/sec in 50 kg of solution and 0,070 m/sec in the version of which 100 kg was applied. The analogical information has been obtained in the meadow – grey soils, too (Table 2). It is obvious from Table 2 that the flow bottom leaching speed

increases while "BO" ionomer solution rising. This solution combines aggregates on soil surface, enhances water absorption ability of soils and consequently the soil washing weakens though flow bottom speed rises (Table 3). The Table analysis shows that soil leaching weakens while increasing the solution quantity applied in soil. For example, in the area where 0,31 l/sec water was applied in the furrow of bright grey-brown soils with 0,021 inclination 228,8 kg of humus, 31,8 kg of nitrogen and 45,0 kg of phosphorus leached from one hectare, in the area where 30 kg of solution was applied, 109,2 kg of humus, 7,6 kg of nitrogen and 24,0 kg of phosphorus were leached from the area where 100 kg of solution was applied. This objective law rendered itself in the meadow-grey mean loamy soils inclination of which is 0,016. So, 217,5 kg of humus, 18,0 kg of nitrogen and 35,5 kg of phosphorus were lost by leaching from one hectare in the version with 0,3 t/sec of water consumption from the area without solution. However, in the version with 30 kg of solution 126,3 kg of humus, 8,8 kg of nitrogen and 27,8 kg of phosphorus were leached from a hectare. As a result leaching gets reduced while a quantity of the solution applied per hectare, 30,9 kg of humus, 2,5 kg of nitrogen and 4,7 kg of phosphorus were leached from the area where 100 kg of solution was applied. The analysis of the consequences approves that "BO" ionomer is very important as a measure of soils degradation control.

Conclusion

"BO" ionomer enhances the stability of soil, the flow bottom leaching speed rises and a quantity of the leaching soil weakens depending on these characters. For the ecosystem balance constant development protection, a good condition is created. As a result of "BO" ionomer application development of the erosion process in soils minimizes, a loss of nutrient decreases. Heat and water-physical characteristics of soil improse, a good condition is created for development of the growing agricultural plants. Therefore, an application of thsesubstanses is rational both ecologically and economically.

REFERENCES

Kagramanova T.M. 2012. Peculiarity of the wind erosion development in the Salyan plain and its prevention measure. Baku, P.135.

Kuznetsov M.S. 1981. Anti-erosion durability of soils. Moscow. Pub. MSU. 1981, p.135.

Kuznetsov M.S., Bazarov O.A. 1993. Anti-erosion durability of some soils in Tajikistan. Soil Science. Moscow. P.96-103.

Nosadze L.P. 2014. About the problem of fertility increase of soils with the help of meliorants-structure formators. News of Nijnevoljsk agro university complex. №1(33), 2014, c.96-100.

Nosadze, L.P. 2014. Choice of optimal composition from structure formation materials for irrigation erosion control scientific journal Kuban SAU №97(03), c.838-841.

Pakhomov A.A. 2016. "Increkse of the efficiency of use of water keeping meliorantss based on local raw material News of Orenburg State Agrarian University №6 (62), c.14-15.

Pogoyansk. K.P. 1982. Optimization of the main characters and regimes in the irrigated typical seromes under artificial structure formation. Tashkent. Pub. "FAN". P.163.

Rakhmanov Sh.V., Igamberdiyev D.A., Rakhimov U.Y. 2017. The ways of insreanse of erodated soils fertility in Namangen area //Young Scientist, №20, c.226-228.

Suleymanov N.R. 2003. Formula of the leaching norm calculation for the complex melioration in the swelling soils. Works of All-Russian Conference- fundamental physical researches in soil science and melioration. Moscow. P. 323-326

Vasilyev S.M., Mityayeva, L.A. 2011. Development of the composition from sorbent moisture for protecting soils from irrigation eroscon processes in irrigated soils. OAS≪Maloorlovskoye≫ in irrigated soils. News of Nijnevoljsk agrouniversity complex №2(22), p.24-31.

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