THE RESULTS OF RESEARCHING THE SOIL FACTOR OF THE PLACE WHERE ELAEAGNUS ORIENTALIS L. TASHKENT – 16 AND SAMARKAND – 7 VARIETIES ARE GROWN

A.J. Kunnazarov[1], N.J. Janabayev[2], S.A. Turdiyev[3]
[1]Basic doctoral student, Institute of Agriculture and Agrotechnologies of the Republic of Karakalpakstan, Nukus[1]
[2]Basic doctoral student, Institute of Agriculture and Agrotechnologies of the Republic of Karakalpakstan, Nukus[2]
[3]Associate Professor, Doctor of Agricultural Sciences, Tashkent State Agrarian University, Tashkent[3]
https://doi.org/10.5281/zenodo.17783953

Abstract*. According to the study of soil reclamation conditions of the experimental field in Khojaly district, where the research was conducted, according to the results of the analysis, the level of salinity and the type of salinity of the soils of the area were determined depending on the amount of dry residue and the fluctuation of chlorine ions along the soil profile. That is, around 0.650-1.044% of the amount of dry residue along the soil profile, the amount of dry residue in the uppermost layer of the profile is 0.650%, its relatively high amounts (0.704-1.044%) correspond to the lower layers of the soil profile, the layers of the soil section are moderately and strongly saline. it became known. Also, according to the composition of the salts, it was found that they mainly belong to the chloride-sulfate, sometimes sulfate-chloride and chloride type of salinity. Distribution of humus in soil profiles is based on uncertain laws. It was found that all genetic layers along the soil profile have almost the same supply of humus, oscillating around 1.40-1.57%.*
Keywords*: Khojaly district of the Republic of Karakalpakstan, oscillating around 0.650-1.044%, at 1.3-1.5 meters, with sulfate-chloride.*

Introduction. It is known that the role of biotic and abiotic factors is important for the expansion of flora. In particular, the seeds of plants are spread with the help of the wind, with the help of anthropogenic factors, and it is possible to enrich the flora by planting seedlings grown from seeds or cuttings in a certain area. But the main role for the growth of these plants is played by the soil and climatic conditions of the region. The process of salinization in the region reduces the fertility of the soil, prevents the growth of plants under normal conditions and eventually leads to the degradation of large cultivated areas.

The negative consequences of the salinization process can be reduced by countermeasures in the initial stages, but with the increase in the amount of harmful salts in the soil and their concentration, the land may become unsuitable for agricultural use. Therefore, studying the causes of the salinization process in the soil, developing a system of measures to prevent and combat it, and developing a system of measures for its application are among the urgent problems of the world.

According to the information provided in the analyzed sources of literature, it is noted that soil salinity can occur under the influence of natural or anthropogenic factors Tursunov L.T. [5],

Pankova E.I., Konyushkova M.V. Researchers such as [1], Popov [2, 3] conducted scientific research. Most of them emphasize that the process of salinization depends on the rise of the underground water level, at the same time, they connect it with the natural-climatic characteristics of the area, and with the lack of implementation of measures aimed at improving the land reclamation.

***Methods of research*.** Conducting field and production experiments, established nursery, intended for growing seedlings according to (GOST-3317–90), seedlings rooted from cuttings of cuttings according to the requirements of UzDSt 2813:2014, (UzDSt 322.15.04.2009), humus in the soil and the amount of nutrients and their mobility was carried out based on the methods of Gustavson, Knop, Robinson and I.V. Tyurin [6, 7].

Research results and their discussion: It is known from the literature that the soils distributed in the Republic of Karakalpakstan have varying degrees of salinity. In this regard, a further deterioration of the natural components of the area, including the ecological condition of the soil, has been observed in recent years. Therefore, in the course of our research, we analyzed the salinity, mechanical composition, and agrochemical parameters of meadow-alluvial soils in order to study the reclamation condition of the soils of the experimental field in Khojaly district of the Republic of Karakalpakstan.

Based on the results of the analysis, the salinity level and type of salinity of the soils of the region were determined based on the amount of dry residue and the amount of chlorine ion fluctuations along the soil profile. That is, the amount of dry residue along the soil profile fluctuates around 0.650-1.044%, the amount of dry residue in the uppermost layer of the profile is 0.650%, and its relatively high amount (0.704-1.044%) corresponds to the lower layers of the soil profile, accordingly, the analyzed soil section it was found that the layers are mainly moderately and strongly saline. Also, according to the composition of salts, it was found that these soils mainly belong to chloride-sulfate, sometimes sulfate-chloride and chloride type of salinity. It is known that one of the factors causing salinity in irrigated soils is the proximity of the groundwater level. Therefore, in the development of measures aimed at improving the reclamation of saline soils in irrigated zones, the depth of underground water is taken into account first of all.



1-pic. The process of taking soil samples from the territory

During the research, it was found that the depth of groundwater in the area is mainly 1.3-1.5 meters. The amount of dry residue in the composition is 2.616%, according to which the level of mineralization of groundwater is weak (1-3 g/l). Also, according to the type of mineralization, it was determined that it is sulfate-chloride (Table 1).

Table 1

Indicators of salinity of soils

The depth of the layer, cm	Dry residue, %	Com-mon, HCO_3	Chlorine (Cl)	Sulfate (SO_4)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	The sum of the components	Salinity	
										Type	The level
Layer-5. Formerly irrigated meadow-alluvial soil, Samankol massive - medium sand											
0-31	0,650	0.061	0.071	0.228	0.02004	0.0243	0.0644	0.1516	0.6203	x-s	average
		0.800	2.000	4.750	1.000	2.000					
31-40	0,638	0.1159	0.088	0.228	0.03006	0.0212	0.0713	0.0821	0.6065	x-s	average
		1.900	2.5000	4.750	1.500	1.750					
40-67	0,775	0.1218	0.0887	0.264	0.04008	0.0394	0.0667	0.1094	0.7363	x-s	average
		2.100	2.5000	5.5000	2.000	3.2500					
67-98	1,045	0.671	0.0887	0.0552	0.0350	0.01002	0.0897	0.04301	0.992	x	average
		11.000	2.500	1.1500	1.700	0.500					
98-137	0,704	0.0488	0.213	0.144	0.07014	0.0182	0.1035	0.07038	0.6691	s-x	strong
		0.8000	6.000	3.000	3.500	1.500					

Table 2

The state of mineralization of groundwater, % / mg-eq

The depth of the layer, cm	Dry residue, %	Com-mon, HCO_3	Chlorine (Cl)	Sulfate (SO_4)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	The sum of the components	Type	The level
137-150	2,616	0,0610	0,426	0,336	0,100	0	1,225	0,336	2,485	s-x	Power-less
		,000	12,000	,000	5,000						

Additional: Total density of groundwater is 20 mg-eq/l, chloride-80 mg/l, pH-7.8 neutral

Differences of soil genetic layers in terms of salinity level, different concentration of salts in layers, and arrangement patterns of salt layers are mainly explained by the mechanical composition of the soil. According to the amount of physical clay (<0.01 mm) in the studied soil type, it was found that the mechanical composition is clay.

The agrochemical properties of the soil are important in determining measures to assess and improve soil fertility. During the research, the obtained data show that the soils of the studied area are not very rich in humus. Distribution of humus in soil profiles is based on uncertain laws. It was found that all genetic layers along the soil profile have almost the same supply of humus, oscillating around 1.40-1.57%. Only, it can be observed that the amount of humus in the subsoil layer has decreased sharply to 0.15 percent. According to the scale "Indicators of humus condition in soils" developed by M.M.Toshqo'ziev, N.I.Shadievalar [2006], the studied soil type can be divided into 2 groups according to the level of humus supply by layers: moderately supplied with

humus (humus amount - 1.0 – 1.5 %) and the group of soils with very low supply of humus (<0.5 %).

The highest amounts of total nitrogen were observed in the tillage and sub-tillage layer, 0.058-0.061%, and its amount gradually decreased to 0.026-0.032% in deep horizons. Such a sharp decrease in the amount of total nitrogen occurs depending on the amount of organic matter in these layers and the degree of salinity. The main source of phosphorus nutrition of agricultural plants is its mobile forms in the soil. However, it was found that there was no phosphorus in the investigated soil type, only in the lower layers of the soil profile, its amount varied from 7.60 mg/kg to 17.88 mg/kg. This situation can be explained by the amount of easily soluble salts in the soil.

Table 3

Salt content, mechanical composition and total amount of nutrients in the soil, % / mg/kg

The depth of the layer, cm	Dry residue, %	Phosphorus (P_2O_5)	Potassium (K_2O)	Hummus	Nitrogen (N)	Mechanical composition
A_1 plow layer 0-31 см	0,6529	0	224	1.4	0,061	mud
A_2 31-40 см	0,6384	0	204	0.15	0,058	mud
B_1 40-67 см	0,7750	7,6	158	1.45	0,032	mud
B_2 67-98 см	1,0448	0	114	1.57	0,026	mud
C_1 98-137 см	0,704	17,88	136	1.55	0,028	mud

The genetic strata of the studied soil type are divided into medium and poor groups according to the amount of exchangeable potassium. Of course, the mechanical composition of the soil, humus content, salinity level, and cultural status are important. Thus, it was found that the amount of exchangeable potassium fluctuates in the range of 114-224 mg/kg along the soil profile.

Conclusion

The studied soils can be divided into 2 groups according to exchangeable potassium supply: the group of soils moderately supplied (200-300 mg/kg) and poorly supplied (100-200 mg/kg) with the mobile form of potassium. In general, according to the results of the analysis, it can be seen that the distribution of nutrients in the soil of the experimental area along the profile depends on its mechanical composition and the amount of humus.

REFERENCES

1. Панкова Е.И., Конюшкова М.В. Влияние глобального потепления климата на засоленность почв аридных регионов // бюллетень Почвенного института им В.В.Докучаева. 2013. Вып. 71. – С. 3-15.
2. Попов В.Г., Сектименко В.Е., Турсунов А.А. Изменение почвенного покрова современной дельты Амударьи под влиянием антропогенного опустынивания. Изд. ФАН, Ташкент, 1992.
3. Попов В.Г., Сектименко В.Е., Разаков А.М. Зональные особенности почв Приаралья // III съезд почвоведов и агрохимиков: Сб. докл. и тез. 5 декабря, 2000. – Ташкент, 2000. - С. 81-82.
4. Тошқўзиев М.М., Шадиева Н.И. Тупроқда умумий гумус ва ҳаракатчан гумус моддалари миқдоридан унинг унумдорлиги кўрсаткичи сифатида фойдаланишга доир услубий кўрсатмалар. Тошкент. 2006. – 47 б.
5. Турсунов Л.Т. Физическая деградация почв низовьев Амударьи в процессе

опустынивания. // Тезисы докл. 1 делегатского съезда почвоведов Узбекистана. Ташкент, 1990. – С. 15-17.

6. Farkhod Chorshanbiev, Malohat Hakimova, Saydali Turdiev Chemical properties of barberry and sea-Buckthorn Plantation Land Soils in Uzbekistan INTERAGROMASH 2022. Lecture Notes in Networks and Systems, vol 575. Springer, Cham. https://link.springer.com/chapter/10.1007/978-3-031-21219-2_216
7. http://agrohimija24.ru/agrohimicheskie-metody/1691-opredelenie-gumusa-pochvy-po-metodu-ivtyurina.html