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Effect of Melioration Drug on Chemical Degradation of Soils

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Annotation: Among the stresses due to chemical degradation, soil salinity is a very serious environmental stress for soil bioindicators, reducing productivity in irrigated lands worldwide [1]. The study of the role of bioindicator enzyme activity in activating the mechanisms of the soil fertility improvement mechanism and the scientific analysis of the effect of soil salt indicators on soil processes serve as a basis for increasing soil health quantitatively and qualitatively. A series of bioindicator biochemical and enzymatic activity processes are activated under saline stress in the soil buffer. It is important to scientifically substantiate the effect of salt stress on biochemical processes on soil degradation. It serves to increase the efficiency of the biosolvent chemical meliorant used in the assessment of soil fertility and its parameters. mitigated the negative impact. In this article, the relationship between the level of soil salinity and urease enzymes in moderately saline alluvial soils degraded by salinity, which accelerates chemical degradation, was studied. Simple options were applied to soils not washed with biosolvent and selected for testing.

Keywords: Chemical degradation, Biosolvent, soil salinity, irrigated soil, soil washing, urease, catalase, invertase.

Introduction. Today, the increase of saline areas has a negative effect on soil fertility. This has a negative impact on the country's economy. Such problems require scientists to create environmentally friendly and effective salt washing agents for leaching soil salinity undergoing chemical degradation, which will be beneficial not only for soil reclamation productivity and indicators of biological indicators.

As a result of anthropogenic influence, secondary salinity is characterized by an increase in the amount of various salts such as NaCl, $CaCl_2$, $MgCl_2$, Na_2SO_4, Mg_2SO_4, Na_2CO_3 carbonates and bicarbonates, nitrites in the soil. Excess presence of these salts in the soil limits soil bio indicators. Salinity is a measure of the amount of dissolved salts in water. It is usually expressed in parts per thousand (ppt) or grams of dissolved salts present in 1000 grams of water [1]. One of the main problems of bio indicators in saline soils is salinity, which is characterized by a direct effect on the activity of biological enzymes, biochemical mechanisms and, as a result, productivity of the soil [2]. Chemical degradation is divided into three types of salinity in the literature: the first is the presence of salts in groundwater, the second is the presence of salts in irrigation water, and the third is transitional salinity [3]. Accumulation of salts in secondary salinity is due to lower salinity and faster rate of evaporation compared to wet soils [4] and higher salinity in the fracture complex [5]. It is known from the literature that salinity directly affects the pH environment of the soil. It is known that saline soils are poor in nutrients and organic matter and rich in salts [6]. Salt concentration depends on chemical, physical biological properties and soil structure. In the initial stages of salt stress, the osmotic process leads to an increase in salt in the soil, which causes various biochemical changes, changes in the activity of antioxidant enzymes [7-8]. Research by scientists has shown that groundwater and water Irrigation water contains many salts such as calcium chloride, sodium

chloride and carbonates, but sodium chloride has a harmful effect on soil bio indicator properties compared to other salts [9].

Research object and used methods

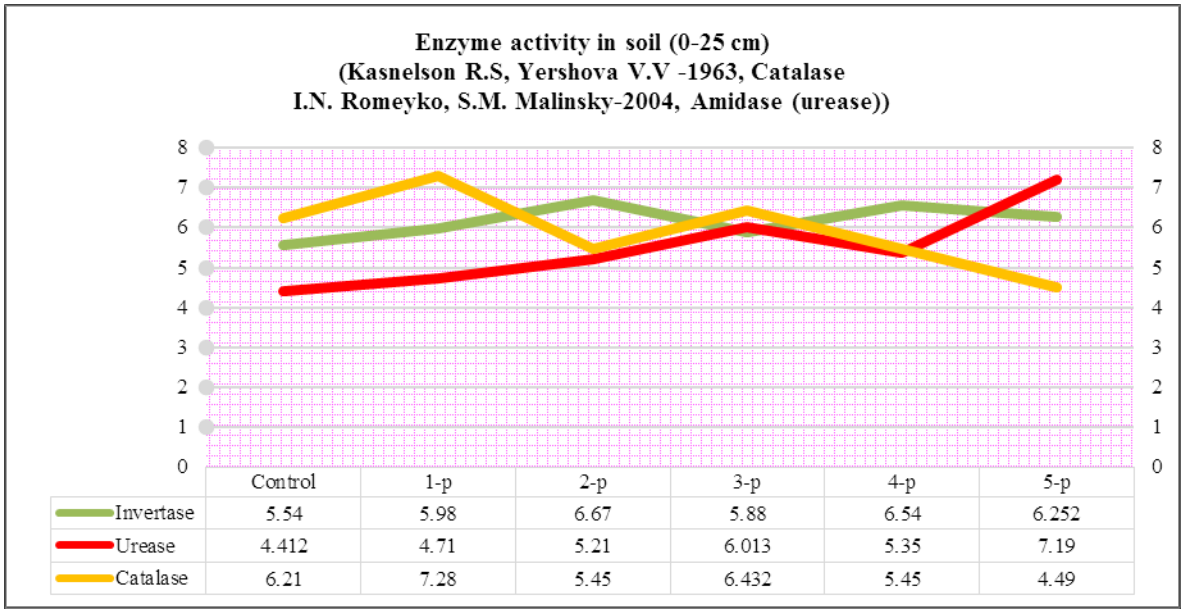
Studying the effects of the "Biosolvent" preparation on the physical and chemical bio- indicator properties of the soil on different levels of salinity and leaching of salts in soils subjected to chemical degradation under the influence of salinity and reducing the level of salinity under its influence. study of the effect on the parameters of the work carried out in laboratory conditions using the information on the land reclamation condition and improvement of the irrigated lands of Uzbekistan subsidiary company "Soil Inspection" and Руководство по химичекому анализу почв.

Аринушкина Е.В (2013), Методы исследования активности почвенных ферментов, Ф.Хазиев (2005) styles, Способ промывки засоленных земель (Губин В.К.) 2004 Methods of taking, storing and conducting laboratory experiments of soil samples in the study area were obtained according to the International standard GOST: 17.4.3.01–83 Reclamation measures GOST. 17.5.3.04-84 performed on the basis of the International standard.

The obtained results and their analysis

Factors leading to chemical degradation are unique from other regions of Uzbekistan: arid climate, mineralization of underground water, proximity to the surface, specific geomorphological, lithological conditions, and soil formation under the influence of human activities. its properties, physical, chemical and biological activity are expressed in bioindicator indicators. It was observed that catalase enzyme activity in soils has a relatively high value of 7.28 ml 0.1 n $KMnO_4$/2.5 s in the upper layer of the soil, that is, in the soil layer with a relatively high level of biological activity, and it sharply decreases in the lower layers of the soil. .71 ml of $KMnO_4$ / 2.5 s. it was determined to go. In weakly saline irrigated meadow soils, catalase activity in the upper soil horizons is 7.28 ml 0.1 n $KMnO_4$/ 2.5 s., that is, in the soil layer with a relatively high level of biological activity, it has a relatively high value. was observed and it was found that 4.9 $KMnO_4$/2.5 s decreases in the lower layers of the soil.

In moderately saline irrigated meadow soils, catalase enzyme activity was 6.67 ml of 0.1 n $KMnO_4$/2.5 s in the upper layers of the soil, i.e. at 0-25 cm. 5.54 ml of 0.1 n $KMnO_4$/2.5 s. was found to decrease in 50 cm layers. In highly saline meadow-alluvial soils, catalase enzyme activity in the upper 0-25 cm layer of the soil is 6.52 ml of 0.1 n $KMnO_4$/2.5 s. was 4.49 ml of 0.1 n KMnO4/2.5 s in the lower 25-50 cm layer, it was found to decrease.



	Control	1-p	2-p	3-p	4-p	5-p
Invertase	5.54	5.98	6.67	5.88	6.54	6.252
Urease	4.412	4.71	5.21	6.013	5.35	7.19
Catalase	6.21	7.28	5.45	6.432	5.45	4.49

Figure 1. Enzymatic activity of irrigated meadow-alluvial soils according to salinity level

Enzymes catalase and urease are included in the class of soil amidase and these enzymes participate in transformation reactions of organic and inorganic substances in the soil.

These enzymes play a key role in the processes of humification and have a protective effect on the soil through the decomposition of various xenobiotics. They also participate in the synthesis and decomposition of organic compounds included in the aromatic series. Catalase and urease (amidase) can serve as an indicator of the effectiveness of humification processes in the soil.

Chemical indicator of salinity of irrigated grassland alluvial soils

Ion	Experiment parameters (Indicators)	Control		Biosolvent 1:1 pH-2.5, 10/100 liters		Biosolvent 1:1.5 pH-2.5,10/100 liters	
		Layer (cm)					
		0-25	25-50	0-25	25-50	0-25	25-50
HCO_3^-	Before washing mg/eq	0,017	0,014	0,011	0,008	0,010	0,009
	After washing mg/eq	0,014	0,012	0,010	0,009	0,011	0,008
	Change (%)	17,64	14,28	9,09	-12,5	-10	11,11
Cl^-	Before washing mg/eq	0,034	0,029	0,033	0,041	0,031	0,018
	After washing mg/eq	0,022	0,017	0,025	0,035	0,022	0,011
	Change (%)	35,29	41,37	24,24	14,63	29,03	38,88
SO_4^{2-}	Before washing mg/eq	0,398	0,477	0,448	0,466	0,447	0,482
	After washing mg/eq	0,328	0,371	0,249	0,285	0,322	0,339
	Change (%)	17,58	22,22	44,41	38,84	27,96	29,66
Ca^{2+}	Before washing mg/eq	0,071	0,098	0,137	0,171	0,149	0,183
	After washing mg/eq	0,058	0,078	0,121	0,152	0,132	0,154
	Change (%)	18,30	20,40	11,67	11,11	11,40	15,84
Mg^{2+}	Before washing mg/eq	0,047	0,058	0,031	0,044	0,035	0,051
	After washing mg/eq	0,039	0,045	0,022	0,031	0,024	0,036
	Change (%)	17,02	22,41	29,03	29,54	31,42	29,41
Na+	Before washing mg/eq	0,047	0,075	0,066	0,071	0,067	0,088
	After washing mg/eq	0,033	0,053	0,045	0,053	0,048	0,062
	Change (%)	29,78	29,33	31,81	25,35	28,35	29,54

It is known that the positive effect of the Biosolvent drug on the chemical melioration composition of the soil was determined in the practical experiments. The practical studies carried out in medium salinity soils showed that in the experimental samples and variants, the Biosolvent in the soil Cl-, $SO4^{2-}$ $Ca^{2+,}$ $Mg^{2+,}$ Na^+, affected the effective leaching of Na+ in the soil solution. In particular, it is more differentiated in the soils obtained from the 0-25 and 25-50 cm layers. Thus, in the experiments, it was noted that the amount of HCO- in the soil increased slightly under the conditions of washing saline soils with ordinary water (control), and it did not change or increased when washed with the Biosolvent preparation. These results indicate that the alkalinity of the soil has not

increased much and is a positive situation. Cl- ions in the control group also increased from 35.29% at 0-25cm to 41.37% at 25-50cm and 1:1 ratio, pH-2.5, 10/100 liters after washing in the soil horizon 0-25, 25-50 cm After washing with biosolvent, it appeared in the amount of mg/eq in 0-25 cm 24.24%, 25-50 cm 14.63% in water absorption. The value of this indicator was found to be from 29.03% at 0-25 cm to 38.88% at 25-50 cm after washing with 1:1.5 ratio ph-2.5, 10/100 liter biosolvent, respectively. After washing the saline soil with plain water (control), SO_4 content in the soil horizon ranged from 0.328% at 0-25 cm to 0.371% at 25-50 cm and after washing with a 1:1 ratio, pH-2.5, 10/100 liter biosolvent From 0-25cm 0.249% to 25-50cm 0.285% water absorption appeared in the amount of mg/eq. The value of this indicator was found to be from 0.322% at 0-25 cm to 0.339% at 25-50 cm after washing with 10/100 liter biosolvent in the soil horizon, 1:1.5 ratio ph-2.5, respectively. Ca 2+ content in the 30-70 cm soil horizon after washing with normal water (control). 0-25cm 18.30% to 20.40% at 25-50cm and 0-25cm 11.67% to 25-50cm 11.11 after washing with 1:1 ratio, pH-2.5, 10/100 liter biosolvent % was shown in mg/eq amount in aqueous extract. The value of this indicator was found to be from 11.40% at 0-25 cm to 15.84% at 25-50 cm after washing with 1:1.5 ratio ph-2.5, 10/100 liter biosolvent, respectively.[11] The Na+ content in the control 25-50 cm soil horizon increased from 0-25cm 29.78% to 29.33% at 25-50 cm and after washing with 1:1 ratio, pH-2.5, 10/100 liter biosolvent 0-25cm 31, From 81% to 25.35% water absorption at 25-50 cm appeared in the amount of mg/eq. The value of this indicator was found to be from 28.35% at 0-25 cm to 29.54% at 25-50 cm after washing with 1:1.5 ratio ph-2.5, 10/100 liter biosolvent, respectively. In general, washing with Biosolvent in the solution of saline soils reduces harmful ions for the soil, including Cl- from 35 to 29%, SO42- from 17.58 to 27.96%, Ca 2+ from 18.30 to 11.40%, Na + 29 .78% to 58.20% significantly increases the leaching rate. Mg 2+ from 17.02 to 28.35. In general, Biosolvent has shown its effectiveness when diluted with water in a ratio of 1:1 10/100 l/ha and 1:1.5 in a ratio of 10/100 l/ha in leaching salts from saline soil, which is 2500-3000 m3/ha allows to save irrigation water.[10]

The biosolvent had a positive effect on the effective leaching of harmful cations and anions in the absorption capacity of saline soil, and its effect on the physical and chemical processes of soil reclamation indicated that it not only helps to reduce soil alkalinity, but also improves its biological and physical properties. has a positive effect on its chemical properties. Weakly saline soils are washed 1 time, moderately saline soils 2 times, and strongly saline soils 3.4 (2-3) times. taking into account the composition, the slope of the land and the degree of leveling, 0.20-0.25 hectares of land is taken and irrigated.

The biosolvent had a positive effect on the effective reduction of harmful cations and anions in saline soil, and its effect on the morpho-biochemical processes of cotton plants showed that it not only helps to reduce soil alkalinity, but also affects its biochemical composition does.

Conclusion.

In general, reducing salinity in chemically degraded soils shows its effectiveness when washing salts from saline soil with Biosolvent, diluted with water in a ratio of 1:1 10/100 l/ha and 1:1.5 in a ratio of 10/100 l/ha showed, it allows to save 2500-3000 m^3/ha of irrigation water.

The biosolvent had a positive effect on the effective leaching of harmful cations and anions in the absorption capacity of saline soil, and its effect on the physical and chemical processes of soil reclamation showed that it not only helps to reduce soil alkalinity, but also improves its biological and physical properties. has a positive effect on chemical properties Weakly saline soils 1 time, moderately saline soils 2 times and strongly saline lands are washed 3.4(2-3) times. In order to wash the salt of the soil with high quality, taking into account its mechanical structure, the slope of the land and how leveled it is, floors with a size of 0.20-0.25 hectares taken and watered. The biosolvent had a positive effect on the effective reduction of harmful cations and anions in saline soil, and its effect on the biochemical processes of showed that it not only helps to reduce soil alkalinity, but also affects its biochemical composition. The biosolvent had a positive effect on the effective reduction of harmful cations and anions in saline soil, and its effect on the morpho-biochemical processes of crops showed that it not only helps to reduce soil alkalinity, but also affects its biochemical composition.[11] positive effect on improvement of the activity of soil enzymes and reduction of soil

salinity in secondary salinity, which is considered a factor of chemical degradation, as well as on changes in bioindicators.[10]

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