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The Degree Of Susceptibility Of Soils To Secondary Salinity (Buz district, Andijan province)

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Annotation: The article analyzes the results of determining the level of salinization of irrigated agricultural land and creating cartograms in the Boz district of the Andijan region, which is part of the territory of Central Fergana.
When determining the level of salinity, taking into account the location of the object of study of the area, the chemistry of salinity, the secondary level of soil salinity are determined and recommendations are given on the rate, duration and number of salt flushes.
Key words: soil, salinization, massif, secondary salinization, soil monitoring, samples, cartography, map.

Introduction

Determination of salinity level, which is one of the main activities of soil monitoring, which includes the detection, observation, analysis and control systems of changes in agricultural land under the influence of natural and anthropogenic factors, was carried out on agricultural land prone to secondary salinity.

It is known that in addition to natural soil formation factors, human activity in agriculture also plays an important role in the development of soil formation. In particular, agricultural techniques and irrigation water used in irrigated farming areas of our Republic have a significant impact not only on plants and soil properties, but also on the soil formation process. It is necessary to correctly assess all the influencing factors in the historical development of soils, which include: the plant world, the climate and relief of the area, the nature of the soil-forming rocks, and human activity. A complete study of the listed factors is of great importance for the correct monitoring of the state of irrigated soils and their agronomic characterization.

Determination of soil salinity is of great importance in agricultural production. Salinity is one of the main soil processes that determine soil fertility, productivity, and melioration-ecological condition of irrigated lands, and the increasing activity of this process in agricultural lands makes it difficult to use arable land, delays modern tillage, seeding periods, negatively affects the normal growth and development of plants, and in many scientific and practical experiments, cotton productivity in weakly saline soils is reduced. 20-30 percent, 40-60 percent in moderately saline soils, and up to 80 percent in highly saline soils.

Based on the mapping work, a "Soil salinization" map of 10 massifs of irrigated land in Boz district was created, the structure and volume of agrotechnical and agromelioration activities were planned, and the optimal norms of salt leaching were determined.

When mapping and creating cartograms of saline lands, the land use plan (history) deciphered in 2004, soil quality assessment maps of the farm prepared in 2013 with a scale of 1:10,000, and the results of previous surveys were used as a cartographic basis.

1. Preparatory works - 10 massifs of 13120 hectares of agricultural land were carried out in Boz district. On average, 1 cross-section was dug from every 18 hectares of agricultural land area (2-meter cross-sections from 10% of the land area, 1-meter cross-sections from 90% of the land area), and soil samples were taken from them.

Cartographic works - maps showing the level of soil salinity drawn in the ArcGIS program were reproduced in the 5th copy, and based on the results obtained, a table (appendix) of the salinity levels of the soil areas in the section of the existing contours of agricultural lands on the agricultural map was shown.

In a situation where salinization processes are accelerating in irrigated lands, preventing salt accumulation and re-salinization processes in the upper root layer of the soil, eliminating their consequences, and solving the problems of land reclamation of irrigated saline lands are among the urgent issues facing agriculture. In

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this regard, it is extremely important to conduct mapping work on irrigated lands, take into account saline soils and accurately determine salt leaching rates, and plan a set of land reclamation measures based on the results obtained.

The lands of Boz district are located in the subtropical desert zone. The land surface is wide undulating, 450-500 meters above sea level, and the annual rainfall is less than 150 mm. Plain part of Fergana Valley. The plants are wormwood, yulgun and shora. The mechanical composition of soils, the level of seepage water and mineralization in the examined lands depend on the structure of these geomorphological elements.

The level of seepage water in grassland soils is 1.5-2.0 meters deep and develops in hydromorphic conditions. The amount of humus (humus) in the soil layer is 0.75-1%, total nitrogen 0.06-0.1%, phosphorus content 0.13-0.14%, potassium 0.9-1%, mobile phosphorus 25-35mg/kg, exchangeable potassium 100-200mg/kg. The soil has different levels of salinity.

It should be noted that knowledge of the soil and its physical properties is of great importance in solving many theoretical problems related to soil salinity. The rate of movement, accumulation, evaporation, and similar processes of water and salts dissolved in the soil composition have a specific character in a soil-soil profile with a uniform mechanical composition (layered soils).

Between irrigation periods, the groundwater level drops to its natural level. This condition leads to the movement of salts to the lower layers during the irrigation period. During the period between irrigations, groundwater in the form of seepage water enters the capillary moisture structure and rises upwards.

Groundwater is of the chloride-sulfate type, with a weak to moderate mineralization of 2.0-4.6 g/liter. In the summer, groundwater is less mineralized due to the liquefaction of saline filtration waters.

Table 1.

Syzot water analysis results.

Syzot water sample	Syzot water depth, cm	*pH*	Type	*HCO3*		*SO4*	*Ca*	*Mg*	*Na+K*	Dry residue, gr/l
1	0-130	7,62	C	0,494	0,08	2,704	0,630	0,074	0656	4,638
38	0-145	7,90	C	0,256	0,084	2,604	0,630	0,086	0,510	4,170

2-жадвал

Classification for determination of the level of mineralization of groundwater. (V.A. Priklonsky, 1960)

T/p №	Groups	Dry residue, gr/l
1.	Freshwater	0-1
2.	Weakly mineralized water	1-3
3.	Medium mineralized water	3-10
4.	Highly mineralized water	10-25
5.	Very strongly mineralized water	25-50
6.	Brackish	>50

Soil salinization is one of the main soil processes that determine the productivity of irrigated soils and the melioration and ecological state of arid ecosystems.

The results of the conducted water-soluble chemical analysis, the quantity and quality of the salt content are shown in the explication drawn up on the salinity cartogram.

Of the total 13,120 hectares of agricultural land surveyed in the district, 3,586.2 hectares or 27.3% are not saline, and the total area of saline irrigated lands is 9,533.8 hectares, or 72.7%.

Including weakly saline lands, 6793.8 ha, or 51.8%, moderately saline lands, 2589.5 ha, or 19.7%, strongly saline lands, 70 ha, or 0.5%, and very strongly or saline lands, 80.6 ha, or 0.6%.

In most of the fog-irrigated lands, the salinity type is sulfate, partly chloride-sulfate. In light mechanical composition, inter-valley elevations, sulfate, and in heavy mechanical composition, the salinity type is sulfate-chloride. [7]

Taking these into account, the following actions should be taken.

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1. Each farm in the massif (region) must plan water use norms depending on natural and irrigation-economic conditions. The total amount of water withdrawn during the year for cotton and alfalfa cultivation should not exceed 10.0-12.0 thousand m3/ha.
2. Improve irrigation technology. It is necessary to introduce drip irrigation, since this method ensures uniform moistening of the irrigated soil, less water is consumed, and water waste is not allowed. Irrigation ditches should not exceed the acceptable length (45.0-50.0 meters) taking into account the slope.
3. In early spring, it is necessary to fertilize the land that has been washed with salt as soon as possible, otherwise the moisture in the soil may re-evaporate and salinity may occur again.
4. During the growing season of cotton, after irrigation, deep cultivation reduces evaporation from the soil surface by 20-30% and prevents salinization. Organic fertilizers, mainly manure, in soils with reduced humus.
5. Introduction of suitable, acceptable and effective methods of crop rotation system.
6. Lowering the water level from the critical point, using economical irrigation methods.

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