JOURNAL OF CRITICAL REVIEWS

ISSN- 2394-5125 VOL 7, ISSUE 04, 2020

IRRIGATION EROSION ON COTTON FIELDS IN CHIRCHIK-ANGREN REGION

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ABSTRACT

The article provides materials on the impact of drainage erosion on traditional sierozems in the Chirchik-Angren area of the Tashkent region. The humus component of soil degradation is a constant genetic feature, the density of the hummus boundary of irrigated soils on the slope under the effect of drainage erosion is decreased. Based on the current study of hummus material, gross sources of nitrogen, phosphorus and potassium, there has been a decline in the level of soil wash, which has a detrimental effect on land fecundity.

KEYWORDS: water erosion, reclamation state, degradation humiliation, irrigation erosion, fertility, terrace, field, agrochemistry, deflation.

INTRODUCTION

Today, the earth has: “land disrupted by leaching and soil depletion is 10.9 million hectares (56%), deflated land under the influence of wind is 5.5 million hectares (28%), land prone to environmental deterioration (with a decreased amount of humus and minerals, freshwater, contaminated and others) is 2.4 million hectares (12%)”. Due to physical deterioration (compacted, swampy, sunken and others) is 0.8 million hectares per hectare (4%), the overall area is 19.6 million hectares per hectare.” This is why the protection, development, and enhancement of the reclamation status of degraded land under the control of natural and anthropogenic causes is one of the urgent problems in world countries.

The essence of plant growth, high yield and quality are largely dependent upon plant accessibility of the required nutrients. Soil is the primary source of cultivated plant root feed. Knowledge of the fundamental properties of the soil and the processes that exist in it under the influence of various natural-historical influences and human intervention, helps you to guide and establish conditions that lead to that soil productivity and maintaining agricultural crop production.

Erosion is one of the causes that dramatically change surface properties If the soil profile is degraded due to the degree of its washout, conditions are broken, which in most cases leads the biological, biochemical, agrochemical and microbiological activity to deteriorate, leading to changes in the quality of organic and mineral compounds through the humiliation process, etc.

Up to the present, the Republic has hosted an event on the advancement of practical farming with the successful use of irrigated soils. In the Republic of Uzbekistan's policy action plan for 2017-2021 “... further enhancement of irrigated land reclamation status, construction of a network of irrigation remediation infrastructure, wide-ranging integration of intensive practices into agricultural output, particularly new and resource-saving agricultural technology and the use of high-performance agricultural machinery “are described as important strategic challenges [5].

MATERIALS AND METHODS

The focus of experiment was the soil of the "Ibrokhimzoda Khondamir" farm of the Tashkent region's Pskent district. The soils of the entity being examined are characterized by traditional irrigated chernozems, meadow and gray-earth-meadow soils. The farm territory is situated in the western part of the right bank in the northern reaches of the river Angren, in the soil and environment district of Chirchik – Angren, amid an extensive contour of irrigated traditional serozems. The total capacity of the land under survey was 96 ha, comprising 86 ha of irrigated arable land. There are III, IV above-floodplain terraces of the Angren river on the farm's land, in lithological and geomorphological terms. They are distinguished by hilly and rolling topography with gentle slopes so that the soil has eroded in varying degrees. Log-like depressions are highlighted between the shafts.

ISSN- 2394-5125 VOL 7, ISSUE 04, 2020

Since soil types of the characteristic irrigation zone of the Tashkent region are identified on its territory, this farm was chosen as the focus of the study. The terrain, land reclamation status and crops are also common. Experimental analyses of irrigation erosion processes on eroded irrigated, traditional serozems have been performed. The work was carried out in three phases. Sections were marked out for the field time according to the level of soil washout, morphological descriptions were made, and soil samples were taken for study from genetic horizons. Agrochemical soil analysis was performed in conjunction with the commonly agreed Agrochemical processes (techniques of agrochemical, agrophysical and microbiological experiments in irrigated cotton fields, Tashkent, 1999; Techniques of chemical soil analysis used in a field research laboratory, Tashkent, 2005). The soil pH value was measured using a regular mercury-chloride electrode with automatic adjustment for temperatures. The content of organic matter and humus was determined by the method of I.V. Tyurin, the determination of the total forms of nitrogen and phosphorus was carried out by the method of Ginzburg et al., The content of mobile ammonium nitrogen N-NH_4 and mobile phosphorus – P_2O_5 – colorimetric method, nitrate nitrogen – N-NH_3–Disulfophenol method, exchange potassium K_2O- by flame photometer method. The outcomes of agrochemical analytical research combined with geophysical analysis methods allow us to solve a variety of soil fertility-related issues. Increasing the volume of humus has been shown to boost the growth conditions of plants, increase soil fertility and, subsequently, the yield of crops (I. I. Karmanov, 1980, M. M. Toshkuziev, 2000). The humus component of degraded soils is a permanent genetic trait, under the impact of irrigation erosion the humus horizon potential of irrigated soils on the slope is decreased, whereas the amount of humus and other nutrients is decreased. Regarding the role of humus in soil development, it is difficult not to consider it as the most characteristic and important part of the soil, directly linked to its fertility. As can be seen by the analytical data obtained in the soil erudition mentioned above, soil cultivation affects humus content in the upper horizons. (Table1)

Table 1. **Agrochemical properties of traditional serozems eroded in irrigation (Tashkent region, Pskent region)**

Section number, degree of washout	Depth, cm	Humus mold %	Gross forms %			Movable, mg / kg forms			Humus Carbon% (Cg%)
			N	P_2O_5	K_2O	P_2O_5	K_2O	N-NO_3	
P-1. Weak washed away	0-25 25-31 31-42 42-73 73-120 120-150	0,89 0,70 0,52 0,38 0,30 0,20	0,061 0,032 0,020 0,031 0,025 0,019	0,168 0,110 0,090 0,102 0,112 0,078	0,86 0,64 0,30 0,30 0,26 0,22	55,0 33,2 26,2 20,1 13,4 16,1	184 179 150 137 125 117	19,0 15,0 14,0 12,0 11,5	0,55 0,39 0,15 0,11 0,09
P-2. Medium washed away	0-26 26-36 36-50 50-72 72-110 110-200	0,82 0,65 0,54 0,42 0,40 0,20	0,058 0,048 0,036 0,030 0,024 0,015	0,126 0,115 0,100 0,088 0,077 0,065	0,75 0,71 0,70 0,64 0,59 0,52	33,2 28,4 20,1 17,3 12,0 10,2	186 170 164 158 149 138	18,0 14,0 12,0 11,5 10,5	0,49 0,30 0,10 0,05 0,03
P-3. washed up	0-29 29-40 40-62 62-79 79-110 110-150	0,92 0,81 0,62 0,40 0,32 0,23	0,065 0,040 0,032 0,025 0,020 0,020	0,155 0,4230, 155 0,143 0,136 0,130	0,84 0,75 0,69 0,60 0,51 0,45	91,0 60,3 57,4 35,2 18,1 14,3	181 175 150 145 137 124	21,0 20,0 18,5 14,5 12,5	0,57 0,50 0,18 0,16 0,14

ISSN- 2394-5125 VOL 7, ISSUE 04, 2020

The value on mildly washed soils is 0.89 percent, declines to 0.86 percent on average washed soils, and increases to 0.95 percent on washed soils. The carbon content of hummus has the same clear regularity of both the hummus distribution and the soil profile, respectively. Nevertheless, the higher horizons contain a larger quantity of hummus, and a small quantity of humus is very marginal. Declining humus in soil is inevitably followed by a reduction in soil's most important agronomic and agrophysical properties. In comparison, the amount of the major plant nutrient elements (nitrogen, phosphorus, potassium) reduces dramatically. Changes in the average nitrogen content of the soil are closely related to the humus content. Because of the scarcity of the humus soils examined, the gross nitrogen content in them is not high either. Based on the most recent analogical observations, the highest concentration of total nitrogen in the highest horizons was observed in all the soils tested, and this indicator decreases in profile depth. Since the nitrogen content in the upper layer is 0.061% in poorly washed soils, it is poorly provided. Mobile forms of ammonia nitrogen-19.0 mg / kg-very low supplied, on average washed out soils overall nitrogen 0.058 per cent-given poorly, mobile forms of ammonia nitrogen 18.0 mg / kg-provided very low, and on alluvial soils gross forms equal to 0.61 percent, and mobile forms 21 mg/kg, suggesting low health by health scale.

The second essential nutrient factor is phosphoric plant nutrition. Characterized soils have a Gross Phosphorus concentration on average. As our work has shown, overall soil phosphorus ranges from 0.168 to 0.126%. The variability of its profile is related to the mechanical structure and substance of humus. The upper horizons produce more total phosphorus and evidently are caused by biological deposition and annual use of mineral fertilizers. The phosphorus content of mobile types is very high, and the average, depending on the degree of vagueness. The average potassium content in the analyzed soil area is 0.86-0.75 percent. Mobile potassium is estimated to be 186-181 mg/kg of soil as a low yield.

CONCLUSION

The study area of the Pskent fog of the Tashkent region is situated in a subtropical climate, characterized by scant vegetation cover, low precipitation, thin humus, and medium and heavy mechanical composition of soils subject to varying degrees of erosion.

The effect of the degree of washout on the position of parts on the slope, as well as irrigation (formation of an agro-irrigation horizon) was exposed in comparison with the results of agrochemical analysis of the studied soils. Possibly, the nutrient and hummus content depends on the quality of the plant cover, the number of organic declines and the slope aspect location of the area. Irrigation corrosion has a detrimental effect on the key properties of the soils examined and results in a reduction in their fertility, while the soil's agrochemical properties and nutritional system deteriorate, contributing eventually to soil compaction, dehumidification and a decline in fertility rates.

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