

Amount of nutritional elements in irrigated soils of Bukhara OASIS**Nazarova S.M.**

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Abstract - *The article shows the influence of the prescription of irrigation on the humus state of soils and the amount of nutrients, with an increase in the prescription of irrigation on the deep layers of the soil profile, the amount of humus and nutrients increases. In soils, there were no sharp differences in the reserves of humus, nutrients (nitrogen, phosphorus, potassium), but differences can be noted across regions.*

Key words: *reserves of humus and nutrient elements, gross and mobile forms of nitrogen, phosphorus, potassium, irrigated meadow soils.*

I. Introduction

Extensive measures are being taken in the country to develop science-based agriculture through the introduction of resource-saving technologies in the efficient use of irrigated lands. As a result, optimization of soil agrochemical properties, increase of productivity and productivity of agricultural crops are achieved.

Decree PF-5853 "On approval of the Strategy of agricultural development of the Republic of Uzbekistan for 2020-2030", Decree PF-6061 of September 7, 2020 "On measures to radically improve the system of land accounting and state cadastre" and Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated June 18, 2019 No 510 "On measures to improve the system of agrochemical analysis of soil in agriculture, increase soil fertility in arable land" to further strengthen food security in the country, increase export potential Improving the system of agrochemical analysis, increasing and maintaining soil fertility in arable lands and their introduction into production, the digitization of agriculture, the organization of research work on the application of new technologies in the field.

II. Literature review

Adequate nutrients in the soil determine soil fertility and ensure high yields from plants. Despite the fact that many scientists have conducted research and made recommendations for the detection, storage and enhancement of soil fertility [1.1975.-34 p., 2. 2019.-62 p., 3. 2016.- pp.109-110. 4. 2004.- 120 p., 5.2019. pp. 91-95. 6. 2019.-44 b. 7. 2016.- pp.268-269] The study of nutrients in the soil is a topical issue.

The object of research was selected irrigated meadow soils in Vobkent, Kagan, Jondor, Karakul districts located in the lower reaches of the Zarafshan river. The studies were conducted in soil-field and analytical laboratory conditions.

In the studied soils of Bukhara oasis, the amount of humus in Vobkent, Jondor, Karakul districts (0.94% -0.80%) was slightly higher in the driving layer than in Kagan district (0.62%). However,

depending on the lower layers, there is no significant difference between the districts in the distribution of the amount of humus, i.e. the amount of humus in the cuts (0.38-0.26%) is close to each other.

III. Analysis

It is known that the amount of total nitrogen in the soil is inextricably linked to the amount of humus, the total amount of which is almost the same in the driving layer of the studied soils, i.e. 0.055% -0.062%. Although its amount decreases depending on the lower strata, there is no sharp difference between the districts.

The same laws are repeated for the total phosphorus content, and the total phosphorus content by districts is very close to each other (0.31-0.21%). This indicates that the agro-technical measures are carried out and the mineral fertilizers are evenly distributed throughout the region. There is no significant difference in the amount of potassium in the districts (2.8-2.0%), only in the lower layers of the soil of Karakul district is 2-2.5 times less than in other districts (Table).

Although there are no significant differences in the amount of mobile nitrogen (N-NO₃) in the soil, they can be seen to some extent. For example, the content of nitrate in the arable and subsoil layers of the soil of Vobkent district is 46-47 mg / kg, in Jondor district - 58-50 mg / kg, in Kagan district - 47-26 mg / kg and in Karakul district - 50-47 mg / kg. does. Although a sharp decrease in nitrate (26-12 mg / kg) was observed in the lower layers of the soils of Vobkent, Kagan and Karakul districts.

Table. Amount of humus, carbonate and nutrients in meadow soils

Line №	Line depth, cm	Humus, %	Nitrogen	Phosphorus	Potassium	N-NO ₃	P ₂ O ₅	K ₂ O	CO ₂ Carbonates, %
			%	%	%	mg/kg	mg/kg		
Vobkent district									
2	0-27	0,94	0,056	0,26	2,3	46,8	11,5	108	7,25
	27-42	0,63	0,058	0,24	2,1	45,7	10,0	103	7,23
	42-70	0,41	0,048	0,27	2,4	25,7	8,0	80	7,04
	70-105	0,37	0,040	0,23	2,1	20,4	8,0	70	7,04
	105-135	0,31	0,040	0,20	2,0	17,5	7,3	65	6,82
	135-155	0,30	0,029	0,19	1,8	14,5	6,0	60	7,00
NSR - 10,2 P, %-0,05									
Jondor district									
5	0-35	0,80	0,062	0,31	2,1	57,7	10,8	130	6,96
	35-50	0,62	0,058	0,29	2,3	50,1	9,5	118	7,04
	50-75	0,52	0,048	0,28	2,0	46,8	8,0	110	7,35
	75-105	0,41	0,050	0,26	1,8	45,7	7,3	93	7,34
	105-132	0,44	0,048	0,25	1,6	31,6	7,8	70	7,04
	132-180	0,36	0,045	0,24	1,5	25,7	6,7	63	7,00
NSR- 12,1 P, %-0,05									
Kagan district									
7	0-25	0,62	0,055	0,21	2,8	46,8	23,0	115	6,96

	25-38	0,60	0,034	0,23	2,6	25,7	15,1	108	6,75
	38-68	0,48	0,048	0,50	2,2	20,4	13,4	95	7,14
	68-96	0,60	0,057	0,37	2,1	19,5	10,0	88	7,28
	96-124	0,38	0,029	0,21	2,0	18,6	10,0	70	6,93
	124-155	0,28	0,024	0,17	1,8	17,5	8,0	65	6,90
	155-185	0,26	0,023	0,16	1,6	14,5	7,3	60	7,07
NSR- 9,4, P, %-0,05									
Karakul district									
9	0-35	0,86	0,056	0,29	2,0	50,1	23,5	140	7,34
	35-62	0,59	0,045	0,23	2,1	46,8	18,3	115	7,21
	62-90	0,40	0,045	0,25	2,0	31,6	11,5	128	7,12
	90-115	0,50	0,050	0,24	1,8	20,4	11,5	115	7,07
	115-147	0,46	0,048	0,21	1,6	21,9	10,0	103	6,93
	147-186	0,38	0,029	0,16	0,8	12,9	7,5	93	6,79
NSR – 9,6 P, %-0,05									

In the lower layer of soils of Jondor district, its content is 2-2.5 times (47-26 mg / kg).

In terms of the amount of mobile phosphorus in the driving layer of soils of Kagan and Karakul districts (47-58 mg / kg), in Vobkent and Jondor districts (11 mg / kg) its amount is relatively high.

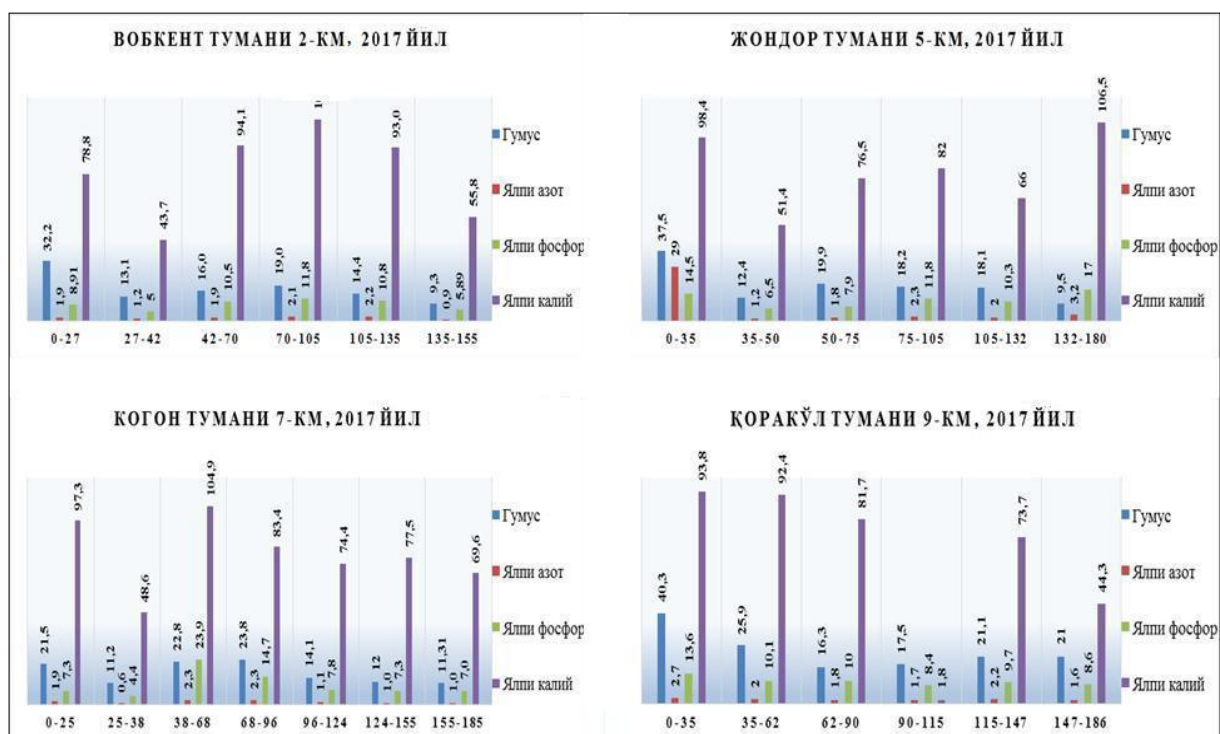
Although the amounts of exchangeable potassium in the studied soils were close to each other in the drive (140–108 mg / kg) and subsoil (60–118 mg / kg), they were recorded mainly at low supply levels.

IV. Discussion

In the old irrigated meadow soils of the Bukhara oasis, the amount of SO₂ carbonates is almost evenly distributed in the sections and ranges from 6.75 to 7.35%. Comparing the data of humus and nutrient reserves of the meadow soils of the Bukhara oasis, a remarkable and interesting situation can be observed.

According to the data (Pic.), the amount of humus reserves and nutrients increases with increasing irrigation frequency in the described soils. Humus reserves in the meadow soils of Vobkent district are 32.2 t / ha in the 0-27 cm layer, as well as 37.5 t / ha in the 0-35 cm layer of the meadow soils of Jondor district, 21.5 t / ha in the 0-25 cm layer in the Kagan district, in the Karakul district in the 0-35 layer is 40.3 t / ha.

The effect of irrigation periodicity on nutrients (nitrogen and phosphorus) is also striking. In particular, the total nitrogen reserves in the irrigated meadow soils at the depth of cut (155 cm) in Vobkent district 0.9 to 1.9 t / ha, total phosphorus reserves from 5.0 to 11.8 t / ha, total potassium reserves from 43.7 to 108.0 t / ha, total nitrogen reserves in Jondor from 1.9 3.2 t / ha, total phosphorus reserves 6.5 to 14.5 t / ha, total potassium reserves 51.4 to 106.5 t / ha, total nitrogen reserves in Kogan 0.6 to 2.3 t / ha, total phosphorus reserves from 4.6 to 10.9 t / ha, total potassium reserves from 48.6 to 104.9 t / ha, total nitrogen reserves in Karakul from 2.7 to 1.6 t / ha phosphorus reserves ranged from 8.4 to 13.6 t / ha, and total potassium reserves ranged from 63 to 93.8 t / ha.



Picture. Reserves of humus and nutrients in irrigated meadow soils of Bukhara oasis, t/ha

V. Conclusion

Although there is no significant difference in the reserves of humus and nutrients (nitrogen, phosphorus, potassium) in the soils of the studied districts, it is possible to observe some differences between the soils of the districts. The amount of humus in the topsoil is slightly higher in Vobkent, Jondor, Karakul districts (0.94–0.80%) than in Kagan district (0.62%). The effect of irrigation frequency on nutrients (nitrogen, phosphorus and potassium) is also noticeable, the total nitrogen reserves are 0.6–3.2 t / ha per hectare, phosphorus 4.6–14.5 t / ha, potassium 43.7–108, 0 tons.

To improve the ameliorative, agrochemical conditions and productivity of irrigated soils of the Bukhara oasis, effective crop rotation systems, stratified land leveling, deep loosening, saline washing and irrigation, organic fertilizers and organic fertilizers. wide use is recommended.

Technology that eliminates soil erosion, increases humus content, reduces soil salinity, retains soil moisture by 3-5%, increases the number of microorganisms due to the accumulation of organic matter, well-developed earthworms, saves technical costs, increases farmers' incomes and economic efficiency of agricultural crops. It is recommended to introduce low tillage and mulching technology.

This technology saves water, soil and energy resources. With the introduction of this agrotechnology, soil fertility is restored and improved, the amount of organic matter and essential nutrients increases from year to year, allows saving 30-40% or more of mineral fertilizer consumption, 2-3 times of organic fertilizer consumption, 3-5 times more than cotton. ts / ha, additional yield of winter wheat will be 8-10 ts / ha. Productivity will increase by 10%, farm income by 30%, irrigation water demand by 20%, and cost reduction by 20%.

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