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INFLUENCE OF LOCAL NON-CONVENTIONAL FERTILIZERS ON SOIL WATER PERMEABILITY

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ABSTRACT

The impact of local non-traditional fertilizers (glauconite, glaucophos) on cotton yield and physical properties of soil water in the cultivation of cotton in the Republic of Karakalpakstan was studied in field experience in 2019-2020. The study found that non-conventional fertilizers applied had a positive effect on soil water permeability. It was found that when glauconite and glaucophos are used in combination with mineral fertilizers in the amount of 1200 kg / ha, they are more effective than other options for soil water permeability.

KEYWORDS: ***soils, mineral fertilizers, saline washing, plant, glauconite and glaucophos, non-conventional.***

INTRODUCTION

The soils of the Republic of Karakalpakstan are low in fertility and saline. Every year, as a result of saline washing, the nutrients in the soil are washed into the lower layers. In order to get high yields from cotton and other agricultural crops in such kind of fuelds, it is necessary to apply large amounts of mineral fertilizers. The application of large amounts of mineral fertilizers every year has a negative impact on soil properties and reduces the ecological status.

Therefore, when cultivating cotton, it is important to reduce some of the mineral fertilizers and use glauconite and glaucophos derived from local agro ores instead. Local fertilizers contain about 20 micronutrients, have a positive effect on plant growth and development, have no harm to the soil, convert nutrients in the soil into a type that can be assimilated by the plant, have a positive effect on soil reclamation.

The total reserves of local agro-ores in Karakalpakstan exceed 70 million tons. In the future, it has the potential to be widely used in agriculture to feed agricultural crops. It is economically and environmentally beneficial.

EXPERIMENTAL OPTIONS AND RESEARCH METHOD

13 options were studied in the field experiment. In the control option, only mineral fertilizers N250 P175 K125 kg / ha were applied, in options 2 and 3,only glauconite and glaucophos were used in the amount of 900 kg / ha. The amount of mineral fertilizers was reduced by 25% N185 P130 K90 kg / ha and to it were applied glauconite and glaucophos in the amount of 600 and 900 kg / ha in options 4 and 5, in 8 and 9 options glauconite and glaucophos in addition to mineral fertilizers in the amount of 1200 kg / ha, of which 600 kg / ha were used under arable land and 600 kg / ha in cultivation, in options 10-13 mineral fertilizers were given in addition to glauconite and glaucophos at 1200 and 1500 kg / ha under arable land.

Research and Field Methods

RESEARCH RESULTS AND THEIR ANALYSIS

The water permeability of the soil is related to its fertility, and the water permeability of soils with good structure is better. When the soil water regime is good, favorable conditions are created for the plant. The plant nutrient regime is directly related to its water regime and in a good nutrient regime the plant grows well, develops and yields are high.

We determined the effect of mineral and local non-conventional fertilizers applied in the experimental field on soil water permeability in relation to norms and application times.

Soil water permeability was 659.0–768.5 m^3 / ha on average (spring) according to the options, with the lowest value being observed in the control

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option (var. 1) (659.0 m^3 / ha). When glauconite and glaucophos from local non-traditional fertilizers were applied without mineral fertilizers in the amount of 900 kg / ha (var. 2 and 3), the water permeability was 670.5-674.9 m^3 / ha in 6 hours, which is more by 11.5-15.9 m^3 compared to the control option.

When the annual rate of mineral fertilizers was reduced by 25% (N180 P130 K90 kg / ha) andglauconite and glaucophos from local non-conventional fertilizers were applied in the amount of 600 and 900 kg / ha (4-7 var.) it was 683.0-715.0 m^3 / ha, 24.0-56.0 m^3 / ha more than the control option. The above-mentioned amount of mineral fertilizers was 742.0-745.0 m^3 / ha when additional glauconite and glaucophos were applied together in the amount of 1200 kg / ha (8-9 var.) and 600 kg / ha of the norm was applied under plowing, and this control was 83.0-86.0 m^3 / ha more than the variant.

Glauconite and glaucophos from local non-traditional fertilizers were applied in the amount of 1200 and 1500 kg / ha, reducing the annual rate of mineral fertilizers by 25%, while glauconite and glaucophos were applied under plowing (10-13 var.) it was 755.0-768.5 m^3 / ha. This is more by 96.0–109.5 m^3 / ha compared to the control option, 84.5–93.6 m^3 / ha compared to options 2 and 3, where only glauconite and glaucophos were used in the amount of 900 kg / ha,53.5-72.0 m^3 / ha compared to variants 4-7 where glauconite and glaucophos were used in the amount of 600-900 kg / ha in combination with mineral fertilizers, 13.0-23.5 m^3 / ha compared to variants 8 and 9, where the norm of glauconite and glaucophos is increased to 1200 kg / ha.

Table 1
Soil water permeability, m^3 / ha (2019)

Variants	Observation hours						In total 6 hours	On average 1 hour
	1	2	3	4	5	6		
In spring								
1	210,0	112,5	98,0	64,5	84,0	70,0	659,0	109,8
2	198,0	120,5	110,0	102,6	78,5	65,3	674,9	112,5
3	205,0	100,5	100,6	90,4	88,5	82,0	670,5	111,7
4	210,0	105,0	103,6	92,5	86,4	82,5	683,0	113,8
5	208,0	107,0	105,6	94,4	86,5	85,5	690,0	115,0
6	213,0	112,0	108,4	96,5	87,1	85,5	705,7	117,6
7	215,0	114,0	110,5	97,4	88,4	86,5	715,0	119,2
8	225,0	124,0	112,5	99,4	90,4	87,5	742,0	123,7
9	220,0	129,0	113,4	100,4	91,5	87,4	745,0	124,2
10	220,0	130,0	115,4	98,4	103,5	92,4	755,0	125,8
11	222,0	130,0	117,4	99,4	100,4	95,0	760,0	126,7
12	220,0	127,0	120,4	105,4	98,4	86,8	758,0	126,3
13	223,0	130,5	122,5	107,7	98,5	86,3	768,5	128,1
In autumn								
1	130,5	80,0	78,0	70,0	77,0	65,0	436,0	72,7
2	148,5	83,6	71,7	64,5	60,0	55,6	483,5	80,6
3	155,0	75,6	75,7	63,5	63,0	67,2	484,6	80,8
4	155,0	71,0	61,7	65,0	61,0	55,7	481,0	80,2
5	153,0	72,7	61,0	66,0	61,7	55,0	479,0	79,8
6	158,0	73,7	63,0	69,0	63,7	57,5	494,5	82,4
7	160,0	78,0	62,7	70,0	63,8	57,5	501,6	83,6
8	165,0	83,0	72,7	73,0	67,5	53,8	524,6	87,4
9	169,0	81,0	75,0	70,7	70,5	63,9	530,1	88,3
10	177,0	86,0	80,7	75,0	78,9	65,5	563,0	93,8
11	179,0	89,7	79,0	79,0	76,9	66,5	570,0	95,0
12	183,0	91,0	81,7	83,9	76,0	68,5	584,5	97,4
13	187,0	94,7	86,0	84,0	79,9	70,5	600,5	100,4

CONCLUSION

So, to improve the water permeability of the soil, we should reduce the annual rate of mineral fertilizers by 25% and apply them to the local non-conventional fertilizers in the amount of 1200 kg / ha, including 600 kg / ha under arable land, 600 kg / ha during the cultivation period, or mineral fertilizers N185P130 K90kg / ha with the combined use of glauconite and glaucophos from local non-conventional fertilizers in the amount of 1200-1500 kg / ha, thus has a positive effect when non-conventional fertilizers are given under arable land.

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Table 2
Soil water permeability, m^3 / ha (2020)

Variants	Observation hours						In total 6 hours	On average 1 hour
	1	2	3	4	5	6		
In spring								
1	199,0	102,5	89,0	55,0	74,0	60,0	579,5	96,5
2	187,0	110,5	101,0	93,0	69,0	55,0	615,5	102,6
3	194,0	90,5	92,0	80,0	79,0	72,0	607,5	101,2
4	199,0	95,0	94,0	83,0	76,0	73,0	620,0	103,3
5	197,0	97,0	96,0	84,0	77,0	76,0	627,0	104,5
6	202,0	102,0	99,5	87,0	77,0	76,0	643,5	107,2
7	204,0	104,0	101,5	87,0	78,0	77,0	651,5	108,6
8	214,0	114,0	103,5	89,0	80,0	78,0	678,5	113,1
9	209,0	119,0	104,0	90,0	82,0	77,0	681,0	113,5
10	209,0	120,0	106,0	88,0	94,0	82,0	699,0	116,5
11	211,0	120,0	108,0	89,0	90,0	85,0	703,0	117,2
12	209,0	117,0	111,0	95,0	88,0	77,0	697,0	116,2
13	212,0	120,5	113,0	98,0	89,0	76,0	708,5	118,1
In autumn								
1	113,0	70,0	68,0	64,0	61,0	50,0	426,0	71,0
2	142,0	77,0	66,0	59,0	54,0	44,5	442,5	73,8
3	148,0	69,0	70,0	57,5	57,0	58,0	459,5	76,6
4	148,0	65,0	56,0	59,0	55,0	45,0	428,0	71,3
5	146,0	67,0	55,0	60,0	55,5	44,0	427,5	71,2
6	151,0	67,00	57,0	63,0	57,5	48,5	444,0	74,0
7	153,0	72,0	57,0	64,0	58,0	48,5	452,5	75,4
8	158,0	76,0	67,0	67,0	61,5	45,0	474,5	79,1
9	162,0	75,0	69,0	65,0	64,5	55,0	490,5	81,7
10	170,0	79,0	75,0	69,0	73,0	54,5	520,5	86,7
11	172,0	83,0	73,0	73,0	71,0	57,5	529,5	88,2
12	176,0	85,0	76,0	78,0	70,0	60,0	545,0	90,8
13	180,0	89,0	80,0	78,0	74,0	61,5	562,5	93,7

REFERENCES

1. *Aimbetov N., Bauatdinov S., Bauatdinov T. Scientific basis ofapplication of glauconites in Karakalpakstan. Nukus.Ilim. 2016.p-210*
2. *Bauatdinov S., Bauatdinov T. Glauconites of Karakalpakstan. Nukus.Ilim. 2013. p-98*
3. *Ismailova A. Influence of mineral agro-ores on cotton productivity.Nukus. Miraziz Nukus. 2018. p-68*